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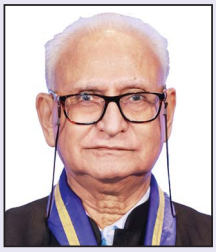

this issue contains...

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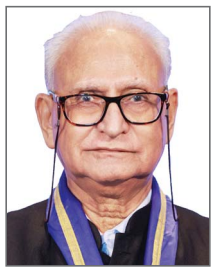
President's Message.....



Dear members..

Hope, the members have fully enjoyed the colours of Holi with their family and friends.

After enjoying the first ever International event organized exclusively "by and for students" at Udaipur under the aegis of Rajasthan Chapter-Udaipur, we had a chance of an excellent virtual Panel Discussion on "Celebrating Women in Mining Industry" organized "by and for women members" of MEAI on 15th March 25. It was a wonderful program, beautifully moderated by Ms Veena Padia, CEO, Gramya Vikas Trust of GMDC. The team of panellists included Ms Vaishali Suravar, Chief Sustainability Officer, Hindalco; Ms Anupan Nidhi, Group CSR Head, Vedanta; Ms Ruchika Jha, Founder WIM India; and Ms Yogeshwari Rane, FCC Mining Engineer, HZL. The program was anchored by Ms Gunjan Pande, Secretary Ahmedabad Chapter, who was also the main brain behind organizing this event. Ms Suchika Gupta, a Life Member from Ahmedabad Chapter proposed vote of thanks. Thus, it was a program fully designed, coordinated and executed by all women only. A beautiful and commendable initiative taken by the Ahmedabad Chapter.

We will soon be witnessing yet another International event, a Conference on "Centre of Excellence in Mining", being organized by the Rajasthan Chapter-Udaipur in collaboration with Hindustan Zinc Ltd. at Udaipur on 26-27 April 25. It aims to trigger open deliberations on benefits of establishment of the Centre of Excellence to solve complex problems of the mining industry and increase its efficiency, profitability and safety through continuous improvement and asset optimization. This event is specially designed to address the most Challenges faced by Industry professionals.

The next (7th) Council meeting is also scheduled to be held at the same venue (Ramee Royal Resort, Balicha, Udaipur) in the evening hours of

26th April. MEAI Members, particularly the Council Members, are expected to join the Conference as well as the Council Meeting in a large number.

MEAI has lost a jewel in Late Shri Deepak Vidyarthi, who left us for heavenly abode on 22nd February 2025. I wish the almighty to grant his soul the peace and the moksha at earliest. It has created a big vacuum for organizing regular events like, MTS, MPDP, MOST and National Quiz. The matter has to be discussed to find a suitable replacement. There is no dearth of technically competent members in MEAI who will be willing to take up this assignment and discharge it efficiently with interest.

In the last council meeting it was also informed that a new (North East) Chapter is going to be launched soon in Assam and about revival of Raipur Chapter. No formal information has come yet. Actions were also being intensified for the revival of the Mumbai Chapter. Some final decisions have to be taken now regarding other dormant chapters. We cannot afford for them to be dormant any longer.

Elections for reconstituting the new Council have become due. We have already finalized the official nominations for various positions. Let us wait and see how many of them get elected unopposed.

With the best wishes.

S.N. Mathur
President

Mining Engineers' Association of India

Regd. Office : Rungta House, Barbil (Odisha)

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EDITOR'S DESK

Dr. P.V. Rao
Editor, MEJ

India's mineral reporting framework (MEMC Rules 2021) talks about two conflicting systems: the outdated UN Framework Classification (UNFC-1997), which underpins the National Mineral Inventory (NMI), and the globally recognized CRIRSCO-compliant Indian Mineral Industry Code (IMIC), ratified in 2019 as India's national standard for public reporting. Despite IMIC's international credibility, its formal adoption by the Indian government remains pending, creating significant barriers to foreign direct investment (FDI) in mining and exploration. International investors prioritize CRIRSCO-aligned reports for transparency and risk assessment, but India's reliance on UNFC-based classifications undermines their confidence.

Regulatory Inconsistencies

The MEMC Rules (2015 and 2021) conflate UNFC Resource/Reserve classification categories with CRIRSCO Template definitions, leading to ambiguity. For instance, the 2021 amendment removed economic viability criteria from the definition of mineral resources, eroding investor trust. Although the National Mineral Policy of 2019 emphasizes attracting FDI, it lacks enforcement mechanisms to mandate IMIC adoption. This policy gap is evident in India's exploration outcomes: despite nearly $300 million in National Mineral Exploration Trust (NMET)-funded projects over a decade, no major mineral discoveries have been made. In contrast, countries like Australia and Canada spend approximately $2 billion annually on exploration and consistently achieve significant discoveries. The government must recognize that exploration projects necessitate far riskier investments, which cannot be met solely through NMET funds.

Challenges in Reporting Credibility

Accountability gaps in India's mineral reporting system exacerbate these challenges. Reports prepared under MEMC Rules often lack reliability, as evidenced by the unauctioned 5.9 million tonnes of lithium reserves in Reasi district, Jammu and Kashmir. The interchangeable use of "Resources" and "Reserves" in press releases has raised doubts among investors, leading to low interest during bidding rounds. Public sector undertakings (PSUs) also face hurdles; they rely on JORC—a CRIRSCO standard used in Australasia—for stock listings because financial institutions reject MEMC-compliant reports. This raises a critical question: why can't India adopt IMIC instead of relying on external standards like JORC?

Bureaucratic Delays

Stakeholder consultations have been ongoing since 2020, including a recent meeting in March 2025 between MEAI/NACRI and government representatives. However, progress has stalled due to unresolved queries raised years ago.

Recommendations for Reform

To address these issues, India must take decisive action to reform its mineral reporting framework:

1. *Mandatory Adoption of IMIC*: IMIC should be adopted as the national standard for public reporting. Aligning MEMC Rules and the National Mineral Inventory with IMIC definitions will ensure compliance with CRIRSCO standards and allow Indian Competent Persons to produce globally recognized reports. The UNECE-CRIRSCO bridging document (2024) can facilitate this transition.
2. *SEBI Mandates for Mining Companies*: SEBI should require mining companies seeking stock exchange listings to provide IMIC-compliant Independent Technical Reports (ITRs).
3. *Strengthening Institutional Capacity*: Collaborative teams combining geological expertise from organizations like GSI/MECL with economic feasibility assessments from professional bodies such as MEAI or private consulting firms should be formed to produce investor-grade reports.
4. *Ethics Code for Competent Persons*: Implementing a code of ethics outlining minimum qualifications and relevant experience for the Competent Persons as per IMIC will enhance transparency and accountability.
5. *Policy Harmonization*: The National Mineral Policy (refer para 5.1), revised in 2019, calls for replacing UNFC with a "globally accepted public reporting standard that ensures reliability for financial institutions and stock exchanges". IMIC should replace UNFC entirely within MEMC Rules.
6. *Utilizing NMET Funds Effectively*: Instead of funding risky exploration projects directly through NMET, these funds should be used by premier bodies like GSI to build robust baseline data across Obvious Geological Potential areas, encouraging private investments to handle detailed exploration and mineral discovery.

India's mineral sector will not attract global capital without standardizing its reporting practices to meet investor expectations. The IMIC offers an opportunity to establish a credible "Made in India" solution that aligns with global standards while addressing domestic needs. Bureaucratic inertia and fragmented policies must be overcome through immediate government action and stakeholder collaboration to unlock FDI opportunities and achieve self-reliance in critical minerals essential for India's future growth.

- Editor

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NEWS FROM THE MINERAL WORLD

Negotiations on mining code for deep-sea mining begin in Jamaica amid mounting pressure from industries

ISA Council members may discuss how to proceed if a deep-sea mining application is submitted later this year before regulations are in place.

Close to 170 member states and the European Union gathered in Jamaica on March 17, 2025, for a two-week-long negotiation on deep-sea mining, a highly controversial issue.

The negotiations will take place at the 30th Session of the International Seabed Authority (ISA) amid increased pressure from industries.

The ISA is an autonomous international organisation tasked with two key goals: Develop the mining code for deep-sea mining and ensure effective protection of the marine environment from harmful effects that may arise from deep-seabed-related activities.

Deep-sea mining involves extracting mineral deposits from the deep seabed at levels below 200 metres. The idea is to extract minerals like copper, nickel, cobalt, and rare earth elements.

Even as countries negotiate on how to frame the mining code to effectively protect the marine environment, mining companies appear to be in a rush. The Canada-based Metals Company has announced its intention to apply for an exploitation plan of work in June this year.

"We are expecting it to become very clear at the March meeting that the Mining Code will not be adopted any time in the near future. There are over 2,000 textual elements that are still under debate," Deep Sea Conservation Coalition Policy Officer Emma Wilson said in a statement.

Pro-mining states, she added, are requesting to establish a process for assessing a mining application despite not having a mining code in place.

The draft mining code has several problems in its current form. According to a November 2024 study in Marine Policy, more than 30 major issues in the regulations remain outstanding due to differences in views and lack of information and time to progress negotiations. Of the 30, 13 items are yet to be discussed, 17 face a lack of consensus, and 14 require additional information or inputs to progress further, it added.

"These gaps include fundamental issues, such as lack of agreement on environmental baseline data requirements," Julian Jackson, Project Director, Ocean Governance at the Pew Charitable Trusts, wrote in a blog.

The other outstanding issues, he explained, are questions such as what constitutes permissible environmental harm, compliance, monitoring and enforcement mechanisms, how to address underwater cultural heritage, insurance and liability requirements.

While the ISA has the mandate to ensure the effective protection of the marine environment from harmful effects that may arise from mining activities, there is debate about the level of harm that might be caused by mining and whether the draft regulations are robust enough to meet that mandate and provide effective control, reads a statement from the European Academies' Science Advisory Council.

At the 30th meeting, experts expect that the ISA Council members — ISA's executive body consisting of 36 members, including India — may discuss how to proceed if a deep-sea mining application is submitted later this year before regulations are in place.

Companies are trying to push deep-sea mining, anticipating shortages in the metals required for the energy transition, adding that terrestrial mining alone will not be enough.

The European Academies' Science Advisory Council has contested this narrative after analysing demand forecasts, the potential for recycling and for technological innovation to change future metal demand.

This was the argument used by the Republic of Nauru, when it issued a letter in 2021 notifying the ISA of the intent of Nauru Ocean Resources Inc's — a wholly-owned subsidiary of The Metals Company — to apply for an exploitation contract in the Area within two years. This triggered the "two-year rule", which stipulates that the Council must adopt the rules for exploitation within two years of receiving such a notice.

The European Academies' Science Advisory Council questioned the urgency with which exploitation of deep-sea minerals is being pursued. "There remains much potential for policy to prioritise a circular economy, support innovation, and minimise continued dependence on the linear economy's focus on extracting virgin materials from nature," it added.

Jackson adds approving a mining application now "might cause irreversible damage to the seabed and threaten both the greater marine ecosystem and Earth's vital systems. Further, there is a still a lack of scientific understanding of the impacts of mining on marine ecosystems.

There are also talks that ISA would face a lawsuit if it rejects mining exploitation applications. Mining proponents have cited the legal doctrine of "legitimate expectations," drawn from investment law. Investors invoke legitimate expectation in claims against host states before arbitral tribunals, for alleged breaches that impact their investments.

But an analysis showed that this argument holds no water because the investment law precedents are based on relationships between sovereign states and foreign investors but not international organisations, such as the ISA.

So far, ISA has been awarding exploration contracts since 2001. As of January 24, 2025, 30 contracts for exploration are active. India, too, has two exploration contracts in the Indian Ocean and has submitted applications to the ISA for two others in 2024.

Several European countries are sponsors of mining contracts with the ISA and Norway is planning to exploit minerals within its own exclusive economic zone and extended continental shelf.

Rohini Krishnamurthy, Down To Earth / 18th Mar, 2025

India's Eastern State Hits Jackpot! Massive Gold Reserves Found Across Multiple Districts; First-Ever Mine Auction Soon

Multiple gold mines were discovered across Odisha, including Sundargarh, Nabarangpur, Angul, and Koraput districts. The state is set to auction its first gold mine in Deogarh. Ongoing exploration in Keonjhar and Mayurbhanj further strengthens Odisha's mining potential.

Bhubaneswar: Odisha is set to emerge as a major gold mining hub, with extensive deposits discovered across multiple districts. Mines Minister Bibhuti Bhushan Jena confirmed these findings in the Odisha Legislative Assembly on Thursday, highlighting the state's growing mineral wealth and its potential economic impact.

Significant gold reserves have been identified in Sundargarh, Nabarangpur, Angul, and Koraput, Odisha TV report said. Initial surveys further indicate the presence of gold mines in Malkangiri, Sambalpur, and Boudh districts. These discoveries place Odisha among India's key gold-rich regions.

In Mayurbhanj, ongoing exploration covers Jashipur, Suriaguda, Ruaansi, Idelkucha, Maredihi, Suleipat, and Badampahad. Earlier, the Adasa-Rampalli area in Deogarh revealed gold deposits during a Geological Survey of India (GSI) G-2 level exploration for copper.

Gold exploration is also advancing in the Gopur-Gazipur, Mankadchuan, Saleikana, and Dimirimunda areas of Keonjhar district.

Odisha's First Gold Mine Auction

In a landmark move, Odisha is preparing to auction its first gold mining block in Deogarh. This marks a historic milestone for the state's mineral sector. The GSI and Odisha Mining Corporation are conducting further investigations in Keonjhar's Mankadchuan, Saleikana, and Dimirimunda for gold extraction potential. Technical committees will review final exploration reports before initiating commercialization efforts.

Future Exploration Plans

Preliminary surveys are underway in Mayurbhanj's Jashipur, Suriaguda, and Badampahad regions, while GSI is conducting copper-gold exploration in Deogarh's Jaladihi area, with results expected by 2025. The Keonjhar region's Gopur-Gazipur deposits await quantity assessments before moving towards auction.

The discovery of gold in Odisha has the potential to transform the state's economy, attract investments, and create new employment opportunities. With auctions and further exploration on the horizon, Odisha could soon become a key player in India's gold mining industry.

Anurag Kumar, ETNOW / Mar 22, 2025

China flexes rare earth dominance with million-tonne discovery

Mountains in China's Yunnan province. Stock image.

China solidified its global dominance in rare earth elements mining with a new discovery that its experts say is likely to be the largest middle and heavy rare earth deposit in the country.

The discovery was first reported in the Chinese paper *Workers' Daily* late January, then confirmed and published by the China Geological Survey (CGS) under the Ministry of Natural Resources. According to the CGS, the deposit could host as much as 1.15 million tonnes of resources containing key rare earth elements such as praseodymium, neodymium, dysprosium and terbium, which are being sought after globally. Once tapped, it would yield about 470,000 tonnes of these strategic minerals, it estimated. The discovery is located in the southwestern province of Yunnan, which is known for its rich endowment of minerals and has some of the largest deposits of aluminum, zinc and tin in China.

Breakthrough discovery

Chinese media claim that the new discovery represents another breakthrough in its mineral exploration, as it is the first super-large ion-adsorption type deposit found in the country in over half a century.

Rare earth minerals on this type of deposit are naturally concentrated and absorbed onto clay surfaces, making them relatively easy to extract through environmentally sensitive methods like ion exchange. The last such discovery dates back to 1969 in the eastern Chinese province of Jiangxi. The new find, according to CGS experts, is predominantly middle and heavy rare earth minerals, which are essential raw materials for electric vehicles, renewable energy and national defense security. Light rare earths used in permanent magnets, on the other hand, are much more abundant in China and mainly distributed in areas such as Inner Mongolia.

"The discovery is highly significant for strengthening China's advantage in rare earth resources, improving the rare earth industry chain, and further consolidating China's strategic dominance in medium and heavy rare earth resources," the CGS posted on its public WeChat account, later reported by the South China Morning Post (SCMP). This massive rare earth find follows the CGS's recent establishment of a national geochemical baseline network, which is designed to help generate extensive data and advance mineral exploration techniques.

Rare earth dominance

The discovery reinforces China's world-leading position in the rare earth mining sector. The Asian powerhouse controls roughly 60% of rare earth production and 85% of processing capacity worldwide. As of 2023, its total mine production was 240,000 tonnes, nearly six times that of the US, the next leading producer and its main rival.

According to the US Geological Survey, China's catalog of REE deposits currently includes 17 metal oxides contained within 44 million tonnes of resources. These include the world's largest rare earths mine, Bayan Obo, in Inner Mongolia. Customs data showed that Chinese rare earth exports rose 6% last year to 55,431 tonnes.

Staff Writer, Mining.Com I March 19, 2025

Centre wants states to take responsibility, check illegal coal mining

Reddy said the Assam chief minister has conveyed to him that around 250 rat-hole mining sites have been closed down in the state and 12 people were arrested in this connection

The Centre on Wednesday said it is the responsibility of state governments to stop all kinds of illegal coal mining, including rat-hole, underlining that it is working in close coordination with states to lower the number of accidents in coal fields.

Asked about the recent accident and loss of lives at a coal mine in Assam where allegedly rat-hole mining was being carried out, Union Coal Minister G Kishan Reddy said in Lok Sabha that he has spoken to Chief Minister Himanta Biswa Sarma on the matter.

"It is the responsibility of the state government to check rat-hole mining," he said.

Reddy said the Assam chief minister has conveyed to him that around 250 rat-hole mining sites have been closed down in the state and 12 people were arrested in this connection. Replying to another supplementary question on alleged illegal mining in Jharkhand, he said the state police and government have to act against it as it is their responsibility.

Reddy said the central government has a zero tolerance approach towards coal mafia and violence in coal mining activities. Safety in coal mines is top priority for the central government and it is working to reduce the accidents in coal mines.

"We have taken a number of steps to reduce the accidents in coal mines and results have started coming in," he said. Asked about the unabated underground fire at coal mines in Jharkhand's Jharia, Reddy said

the fire has been going on for over a century and the central government is working on a few action plans to douse the fire completely.

"We need cooperation of the state government too. I had a meeting with Chief Minister Hemant Soren and hopeful that we will be successful in our plans," he said.

Press Trust of India New Delhi / Mar 12 2025

Kerala Assembly urges Centre to withdraw deep-sea mining proposal

The resolution moved by Chief Minister Pinarayi Vijayan was passed amidst the opposition UDF MLAs protesting

Kerala government has already made it clear that the Centre's move to initiate deep-sea mining along the state's coast cannot be allowed at any cost. The Kerala assembly on Tuesday passed a resolution urging the central government to withdraw its move to allow deep-sea mineral mining off the coast of the state.

The resolution moved by Chief Minister Pinarayi Vijayan was passed amidst the opposition UDF MLAs protesting in front of the Speaker's dais accusing him of acting as an "agent" of the ruling front. The UDF MLAs were protesting for not allowing the Leader of the Opposition in the state assembly V D Satheesan to complete his speech before walking out as their demand to adjourn the business of the house to discuss ASHA workers' protest was not accepted. Due to this protest, the deep-sea mining resolution was passed without discussion.

The Kerala government has already made it clear that the Centre's move to initiate deep-sea mining along the state's coast cannot be allowed at any cost and the concern of the state's fishermen community in this regard has already been conveyed to the union government.

Both the criteria in the Offshore Areas Mineral (Development and Regulation) Act - 2002, and the amendments made to it last year were not in the interests of states, it had said earlier in the House. The ruling front had also urged the opposition Congress-led UDF to join the agitation against the proposed deep-sea mining. The UDF has rejected the invitation for a joint protest, alleging that the Left government was "supporting" the mining initiative.

It has said that it will protest against the Centre's move separately. The government had said in the Assembly last month that in the long run, the deep-sea mining would destroy the traditional marine and backwater fish stock completely, accelerate coastal erosion and job loss, and pose a hindrance to the vessels of the fishermen. Kerala Industries Minister P Rajeeve recently said that Kerala had formally registered its protest against the deep-sea mining proposal on three occasions.

Last month a 24-hour hartal was organised in the state by fishermen unions under the Kerala Fisheries Coordination Committee to protest against the central government's decision Fishermen had refrained from fishing activities as part of the protest, leading to disruptions at fishing ports, fish landing centres, and fish markets across the coastal stretch from Kasaragod to Thiruvananthapuram.

According to the committee leaders, the Centre has decided to auction sand blocks for offshore mining in five sectors Kollam South, Kollam North, Alappuzha, Ponnani and Chavakkad. As part of the protest, the committee plans to hold a Parliament march on March 12.

PTI Thiruvananthapuram / Mar 04 2025

Exploring critical minerals in Zambia, Congo, Australia: Mines secy Rao

The move comes as India is taking efforts to reduce its reliance on imports of minerals such as lithium, key to energy transition technologies

New Delhi in January 2025 approved 1 Rs 63 billion ($1.88 billion) to develop the critical minerals sector.

India is exploring mining of critical minerals in Zambia, Congo and Australia, Mines Secretary V.L. Kantha Rao said on Thursday, as the world's fastest-growing major economy aims to secure raw materials such as lithium. Companies like Coal India, NMDC and ONGC Videsh are exploring critical minerals in Australia, Rao said.

The move comes as India is taking efforts to reduce its reliance on imports of minerals such as lithium, key to energy transition technologies.India is still in the process of developing lithium processing technology, a sector predominantly led by China.

The Zambian government has recently agreed to give 9,000 square kilometers to India for exploration of cobalt and copper, Rao said in a media conference, adding that India is also looking at Congo and Tanzania for mining critical minerals.

(Continued on Page 32)

A GTS REVIEW OF DIGITAL TRANSFORMATION ACROSS EXISTING AND EMERGING PHASES IN THE MINING INDUSTRY

N. Sri Chandrahas, A. Surendra Babu, T. Malleshwara Rao, S. Hareesh Babu and Kuldeep Singh

Abstract

Digital transformation in mine planning and management leverages advanced technologies and data-driven strategies to optimize operations, enhance safety, and improve productivity. The integration process begins with digitization through the deployment of sensors, IoT devices, and automation systems, enabling the collection of real-time data on equipment performance, environmental conditions, and worker safety. Advanced data analytics and machine learning algorithms process this data to identify inefficiencies, predict equipment failures, and optimize resource utilization. Remote monitoring and control systems further enhance operational efficiency and worker safety by minimizing the need for physical presence in hazardous areas. Additionally, virtual reality (VR) and augmented reality (AR) technologies offer immersive training environments, simulating real-life scenarios in controlled settings. Effective mine planning, scheduling, and the use of advanced blast design software are critical for reducing downtime and improving overall productivity. The application of AI technologies provides predictive insights, automates tasks, and streamlines operations, fostering sustainable and efficient mining practices. GMMCO Technology Services Limited has reviewed various existing digital applications and explored the potential for new innovations. This article critically addresses these applications and opportunities using advanced mine planning software and machine learning algorithms.

Keywords: *Digital Transformation, IoT, AI, AR-VR, UAV, Deswik, Micromine, Spry and Mine Management*

1. INTRODUCTION

Digital transformation in mining is essential for operational optimization, safety enhancement, and productivity improvement. Muller et al. (2018) emphasize digitization's role across exploration, extraction, processing, and transportation (Figure 1). Through sensors, IoT devices, and automation, real-time data on equipment, environment, and safety are collected (Sun et al., 2020). Advanced analytics and machine learning analyse this data, identifying inefficiencies and predicting failures. Remote monitoring enhances safety and efficiency, while VR and AR technologies provide immersive training for miners (Peters et al., 2018).

Effective mine planning, scheduling and the adoption of advanced blast design software are integral aspects of this transformation in various stages of mining activities as indicated in figure 2 (a & b) (Wen et al., 2018). Through comprehensive mine planning, companies ensure efficient resource utilization and well-coordinated operations, consequently reducing downtime and boosting productivity (Tobias et al., 2019).

Scheduling tools aid in aligning activities and resources, leading to smoother operations and improved time management (Sun et al., 2020). Blast design software enhances fragmentation and muckpile prediction, optimizing the blasting process for heightened safety and efficiency (Fuerst et al., 2020).

Figure 1: Digital Transformation in Mining Industry using AI, UAV and IoT

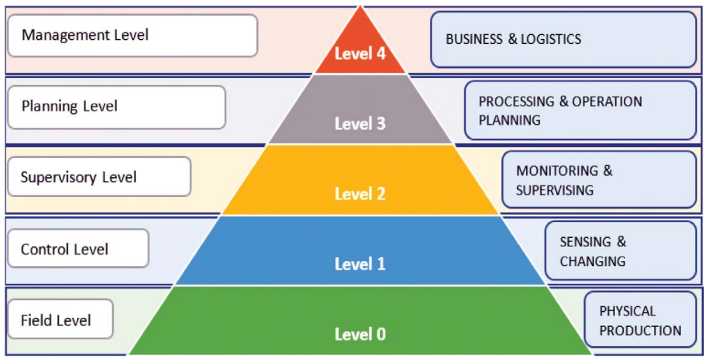


Figure 2(a): Digital Transformation Pyramid for Mine Planning and Management

GMMCO Technology Services Limited (GTS Ltd), Hyderabad, India

EXPLORATION	MINING	PROCESSING	OPTIMISE & CONTROL	SALE
• Exploration & Geology • Geological Modelling • Resource Reporting	• Design, Plan & Schedule • Drill & Blast • Excavation & Material Hauling	• Coal Washing • Crush & Convey • Grinding & Floatation • Load & Transportation	• Production Reporting • Cost Accounting • Optimisation Analysis	• Financial Accounting • Inventory Management • Transport & Logistics

Figure 2(b): Mining Value Chain

The incorporation of artificial intelligence (AI) technologies further amplifies the benefits of digital transformation in mining (Muller et al., 2018). AI offers predictive insights and automates complex tasks, thereby streamlining operations and minimizing human error (Tobias et al.)

2. LITERATURE REVIEW: ROLE OF DIGITAL TECHNOLOGY IN MINE PLANNING AND RESERVES ESTIMATION

a) A comprehensive mine plan is essential for the successful operation of a mining project. It involves detailed steps from exploration and feasibility studies to design, regulatory approvals, operational planning, financial management and eventual closure and rehabilitation.

b) By integrating various management and accounting applications, mining companies can enhance efficiency and ensure compliance with regulatory requirements. This structured approach not only optimizes resource extraction but also ensures sustainable and responsible mining practices.

c) In the modern mining industry, mine planning software plays a crucial role in optimizing and streamlining the planning process. Here are the step-by-step processes involved, viewed through the lens of mine planning software. Figure 3 depicts an opencast coal mine with various mining operations.

Figure 3: *A View of Surface Coal Mine*

2.1 Unique Parameters for Advanced Mine Planning Design

2.1.1 Land Record Management System

- Leveraging Land Records Management Systems (LRMS) is essential for sustainable mine planning. LRMS offers a wealth of data crucial for identifying suitable land parcels for mining activities, including ownership details and legal status, thus minimizing conflicts and ensuring regulatory compliance.
- LRMS facilitates comprehensive environmental impact assessments by providing insights into environmentally sensitive areas and protected habitats. This data is instrumental in mitigating environmental risks associated with mining operations.
- Additionally, LRMS aids in community engagement by offering valuable information on local demographics, land tenure systems, and cultural heritage sites. Effective dialogue with stakeholders is essential for addressing concerns, building trust, and aligning mining activities with community interests.

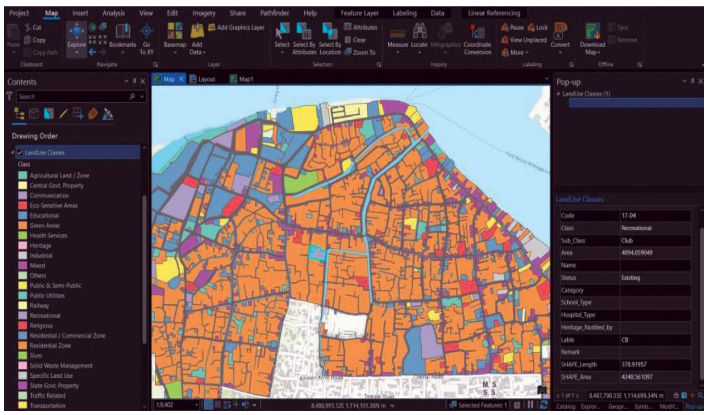


Figure 4: *Land use Classification in GIS Desktop Application*

- Furthermore, LRMS supports infrastructure planning by providing data on existing roads, utilities, and transportation networks. It also helps identify and mitigate risks such as land tenure disputes and geological hazards
- GIS technology plays a critical role in identifying and evaluating prospective parcels of land. It allows us to view the land in question, understand its topography, identify any natural or man-made features that may impact utility placement and visualize the location in relation to other parcels, roads and existing infrastructure. The various capabilities of LRMS are presented in Figures 4 to 7, respectively.

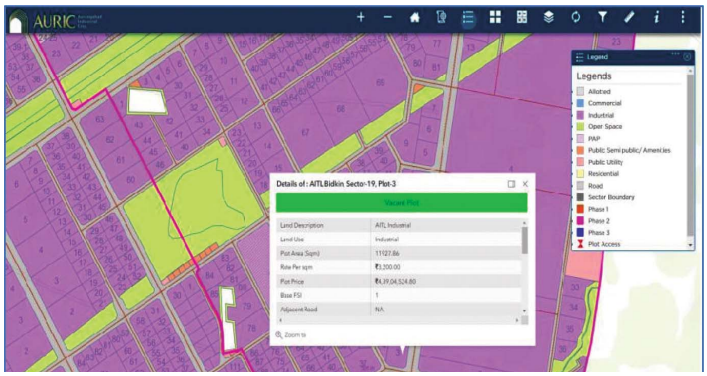


Figure 5: *GIS Application for Land Records Management*

Key features of GIS Asset Management:

- GIS provides real-time monitoring and big data logic, helping businesses prioritize according to their needs.
- It creates regions to log, display and allocate information about an asset and enables better organization and management of assets.
- GIS automates mapping and aids in transport asset management.
- GIS creates Smart maps and online dashboards and allows supervisors to have an expansive view of their assets.
- It has the ability to analyze and collate different types of assets to uncover correspondence, drawbacks and patterns.

2.1.2 Simulation of Bench/Dump Slope Angle and Failure Analysis

- Numerical modelling enables detailed geotechnical characterization of the ore body and surrounding rock mass, providing essential data on rock properties, fractures, and discontinuities.
- Through finite difference methods, numerical modelling accurately models stress and deformation behaviour within the rock mass, allowing engineers to assess potential ground movement and stability concerns. A figure of structural displacement is presented in Figure 8.
- Numerical modelling simulates slope stability under various conditions, considering factors such as slope geometry, material properties, groundwater flow, and seismic loading, providing insights into potential failure mechanisms. A figure of water impact on bench stability is presented in Figure 9.
- By analysing stress distributions and failure criteria, numerical modelling predicts failure modes such as sliding, toppling, or shear failure, aiding in the identification of critical failure surfaces and potential hazards.

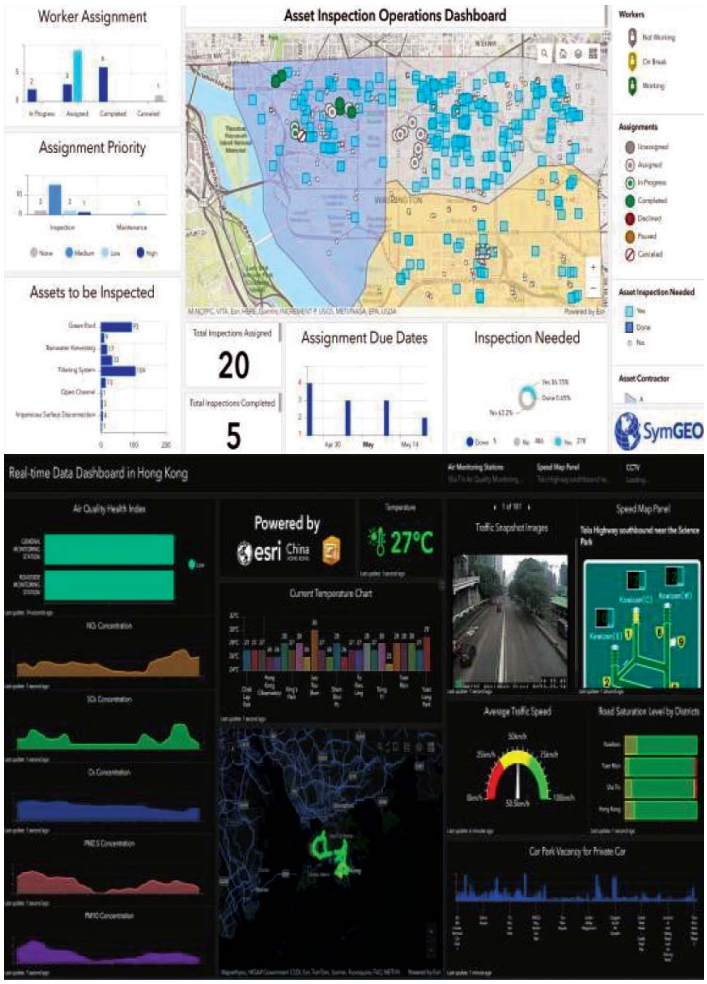


Figure 6 & 7: *GIS Dashboard for Asset Inspection and Workforce Management and CCTV Integration*

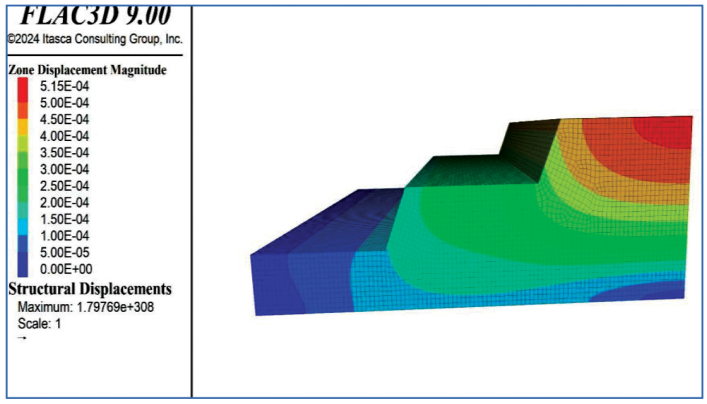


Figure 8: *3D model Represents Structural Displacement*

- Numerical modelling quantifies risks associated with slope instability, providing probabilistic assessments of failure likelihood and consequences, essential for risk management and decision-making in mine planning.
- Utilizing optimization algorithms, numerical modelling assists in optimizing pit design parameters, such as

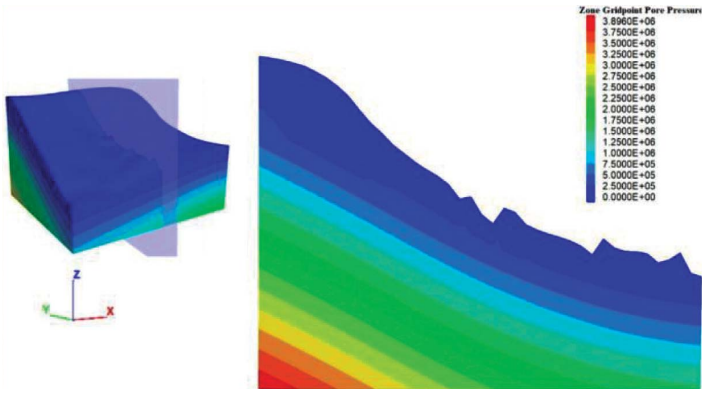


Figure 9: *3D model Represents Water Impact in a Bench*

bench height, inter-ramp angle, and overall slope geometry, to achieve the desired balance between stability, safety, and economic efficiency.

- Numerical modelling conducts sensitivity and uncertainty analyses to evaluate the impact of input parameters and uncertainties on slope stability, enhancing the robustness of mine planning decisions.
- Numerical modelling assesses the environmental impact of mining activities by modeling factors such as erosion, sediment transport, and surface water interactions, aiding in the design of sustainable mining practices.
- Beyond initial design, numerical modelling supports ongoing slope monitoring and management, enabling real-time assessment of slope stability and proactive risk mitigation strategies throughout the mine's operational lifespan.

2.1.3 Ground Water Assessment

Hydrogeological considerations play a crucial role in mine planning, especially regarding groundwater management. Evaluating groundwater conditions, water table fluctuations, and potential dewatering requirements with numerical modelling analysis is related to and assists in mine planning:

- Numerical modelling in mine planning comprehensively addresses groundwater dynamics. It assesses how water pressure and saturation influence slope stability, aiding in designing resilient slopes, as shown in figure 10 hydrological model.
- Engineers model water flow to optimize dewatering strategies, maintaining dry working conditions and minimizing water ingress. Predicting water table fluctuations guides pit excavation planning, ensuring stability over time.
- Moreover, numerical modelling evaluates the environmental impact of groundwater management, minimizing contamination risks and preserving water quality and ecosystems.

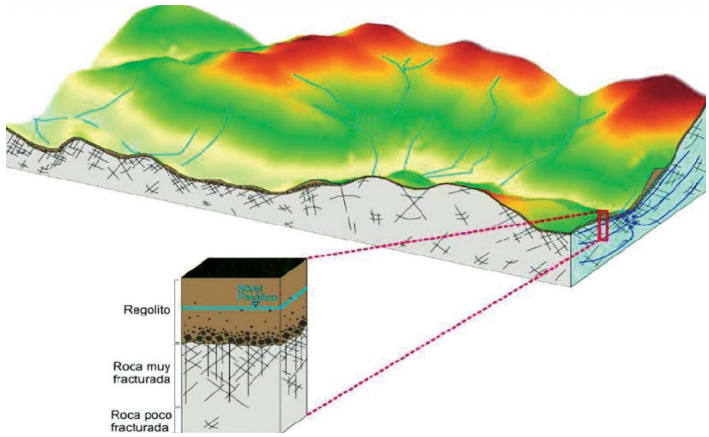


Figure 10: *Hydrogeological Model*

- Integrated with other planning tools, it optimizes mine infrastructure design, including tailings dams and water storage facilities, for sustainable water management practices. This holistic approach ensures efficient and resilient water management throughout the mining lifecycle

2.1.4 Environmental Assessment Through Technology

a) Habitat Disturbance Analysis: Geographic Information Systems (GIS) software is commonly used to map sensitive habitats, endangered species habitats, and biodiversity hotspots. Spatial analysis tools within GIS help quantify habitat fragmentation and assess the potential impact of mining activities on wildlife populations. Additionally, remote sensing data can provide valuable information for habitat mapping and monitoring over large areas.

b) Air Quality Monitoring and Management: Air dispersion modelling software, such as AERMOD or CALPUFF, predicts the dispersion of airborne pollutants emitted from mining operations. These models consider factors such as meteorological conditions, emission rates, and topographical features to estimate pollutant concentrations at different receptor locations. This information helps assess air quality impacts and design effective dust control measures.

c) Soil Erosion and Sedimentation Control: Soil erosion modeling software, like RUSLE or WEPP, simulates soil erosion processes and predicts sediment yield from disturbed areas. These models consider factors such as soil properties, land use, slope, and rainfall

d) intensity to estimate erosi on rates and identify erosion-prone areas. Soil erosion control measures can then be implemented based on the modelling results to mitigate sedimentation impacts on water bodies.

e) Regulatory Compliance and Stakeholder Engagement: Environmental management systems (EMS) software, such as EHS Insight or Enablon, help mining companies

track regulatory requirements, manage permits, and document compliance efforts. Stakeholder engagement platforms, like StakeTracker or Socialsuite, facilitate communication and collaboration with regulatory agencies, local communities, and other stakeholders, ensuring transparency and accountability in the mine planning process.

2.1.5 Water Management

- Software applications are instrumental in meeting the triple imperative for sustainable water management in mining. Leveraging digital solutions, companies implement efficient water recycling and real-time monitoring, reducing water wastage and pollution.

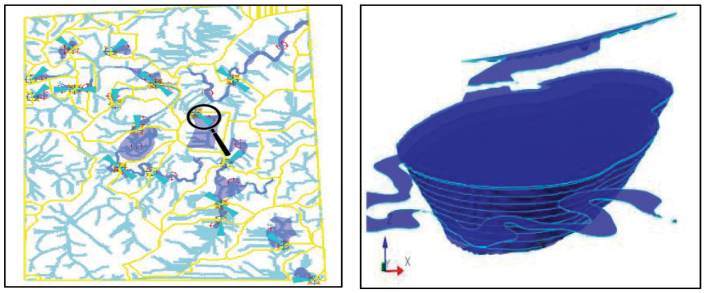


Figure 11: *Using 3-D Software to Assess Identify Catchment and Assessment of Water Quantity*

- Zhao et al. (2019) highlight how these tools minimize the environmental footprint by providing real-time data on water quality, usage, and discharge, enhancing sustainability and compliance. Integrated into water management strategies, these applications inform mine planning decisions.
- It offers, insights into water availability, quality, and usage, aiding in pit design optimization, environmental mitigation, and long-term sustainability. Figures 11 underscore the role of digital solutions in environmental monitoring and management, further emphasizing their significance in mining operations.

2.1.6 Mine Planning Using Advanced Software

- By integrating advanced software interventions like Land Records Management Systems (LRMS), numerical modelling for slope analysis, and hydrogeological assessment tools, mine planning achieves unprecedented accuracy and efficiency.
- These technologies provide invaluable insights into land suitability, environmental impacts, and groundwater management, enabling engineers to make data-driven decisions throughout the planning process.
- Through comprehensive environmental assessment and stakeholder engagement facilitated by Geographic Information Systems (GIS) and environmental management systems (EMS), mine planners can ensure regulatory compliance, mitigate risks, and optimize infrastructure design.
- Figures 12 -15 showcase modern mine planning's diverse capabilities in designing pits with precision. These integrate advanced technologies and data-driven approaches to optimize pit design across various stages. They enable planners to navigate terrain, mitigate risks, and ensure safety, sustainability, and operational efficiency.

Benefits of Mine Planning Software:

- Details on all mineral(s) to be mined
- Detailed estimated information over time (short/mid and long term): volume, grade, yields, etc
- Equipment to be utilized / extraction methods
- Health, safety, hazardous waste, regulatory considerations
- Detailed mine maps (topographical and cross-sectional) with campaign specifics / future phasing or sequencing
- Detailed locations of dumps and stock piles

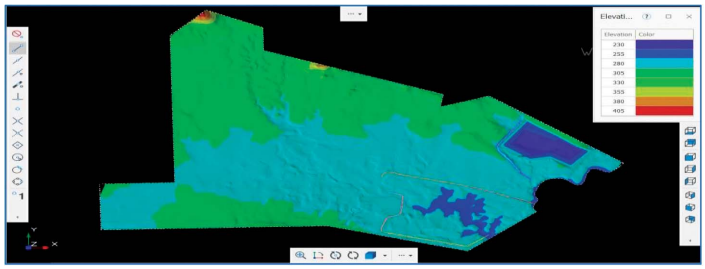


Figure 12: *Surface Topo Showing Drains and Pit in Mine Planning Software*

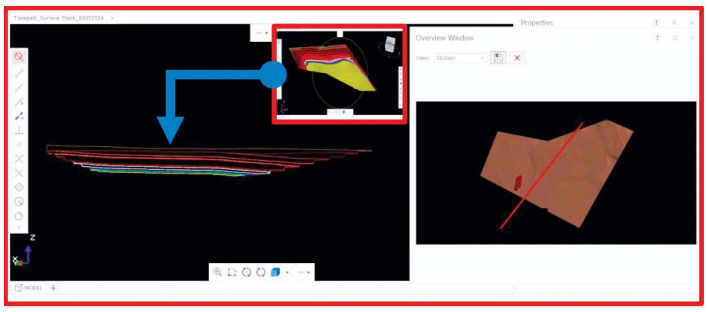


Figure 13: *Sectional View Showing Coal Seams in Mine Planning Software*

2.1.7 Blast Design & Vibration Prediction using AI-ML Techniques

- Advancements in computing power led to the integration of AI and ML technologies, facilitating predictive maintenance and geological modelling and joints prediction as shown in figure 8 (Ma et al., 2019).
- ML algorithms analyze historical data to optimize production schedules and reduce costs (Mukherjee et al., 2019).

- AI is playing pioneering role in blast design, prediction, back-break and blast analysis.

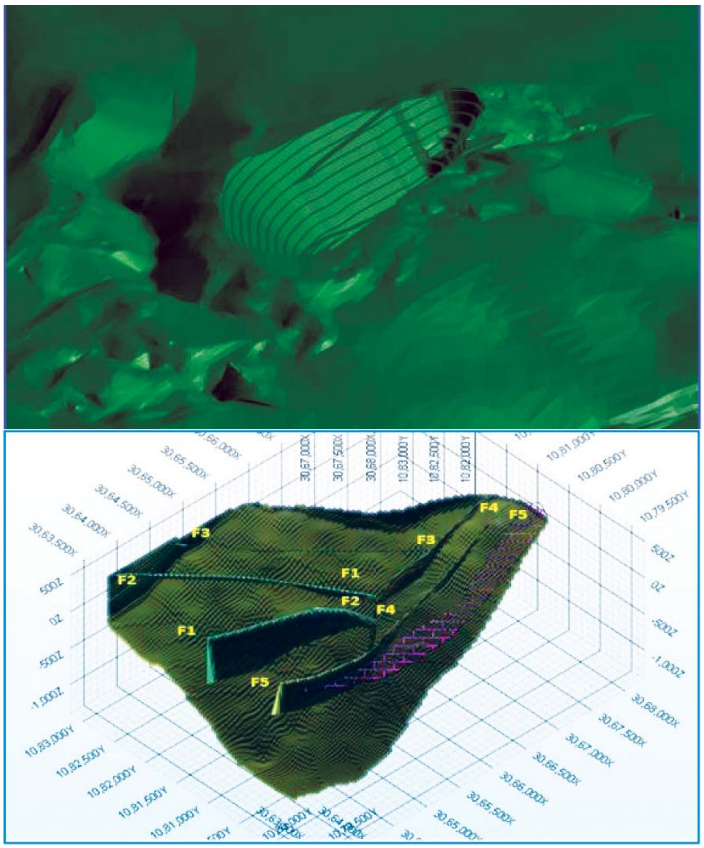


Figure 14 & 15: *Surface Topo Showing Pit in Mine Planning Software and Geology Resource Model and Faults in Mine Planning Software*

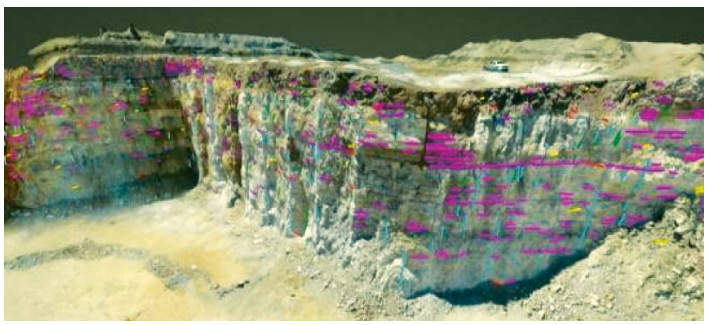


Figure 16: *Joints Prediction using AI*

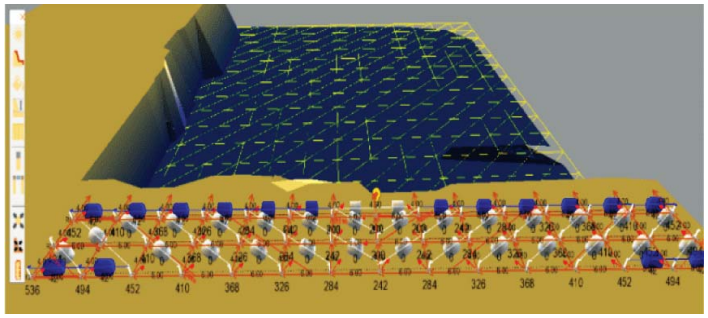


Figure 17: *Blast Design and Simulation*

- AI-driven models utilize advanced algorithms, primarily drawing from machine learning and neural networks, to intricately simulate and optimize blast designs (Smith et al., 2020) as shown in figure 16.

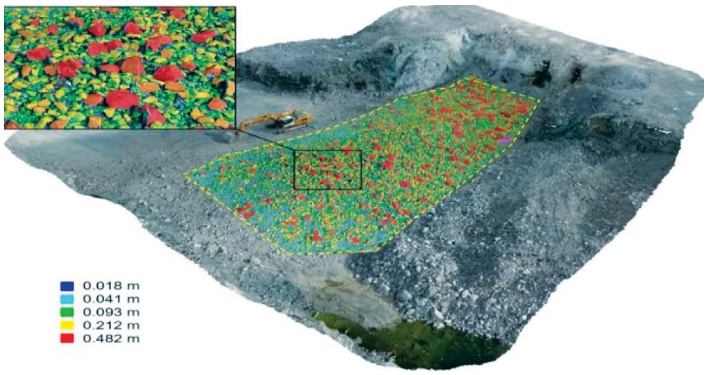


Figure 18: *Joints Prediction using AI*

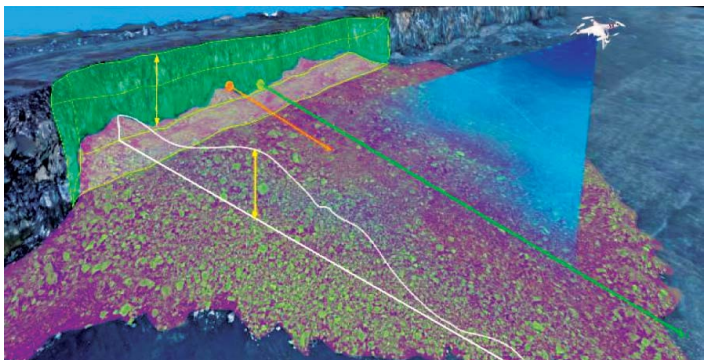


Figure 19: *Blast Design and Simulation*

- AI significantly amplifies fragmentation efficiency while concurrently minimizing over break, thereby yielding a substantial enhancement in productivity and a tangible reduction in operational costs.
- In parallel, AI systems in mine blasting operations execute real-time monitoring coupled with predictive analytics to proactively anticipate and rock fragmentation and mitigate ground vibrations as shown in figures 18 & 19 (Jones & Johnson, 2019).
- Furthermore, AI technologies, leveraging cutting-edge data analytics and sophisticated modeling techniques, meticulously predict and mitigate the adverse effects of back break—a phenomenon characterized by the unwanted fracturing of rock behind blast holes (Gupta et al., 2021) as shown in figures 20 & 21.

2.2 Automation and Remote Monitoring and emergence of IoT and Big Data Analytics

- The integration of automation and remote monitoring technologies began in the late 20th century, enhancing operational efficiency and reducing manual labor dependency (Yellishetty et al., 2017).

Figure 20: *Joints Prediction using AI*

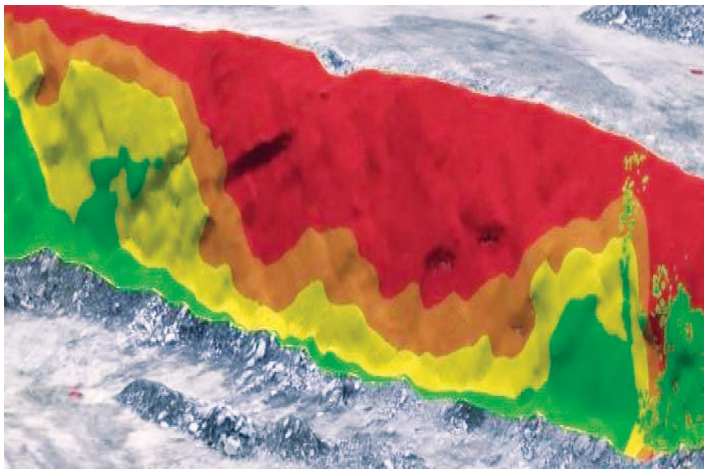


Figure 21: *Back-break Prediction*

- Computer advancements enabled centralized control centers for real-time monitoring, facilitating prompt decision-making and issue resolution (Ma et al., 2019).
- The 21st century witnessed the widespread adoption of IoT devices and sensors, enabling extensive data collection from various sources (Mukherjee et al., 2019).
- Big data analytics emerged to process and analyze this data, providing valuable insights into operational performance and predictive maintenance (Yellishetty et al., 2017).

2.3 Impact on Safety

a) Real-Time Monitoring and Predictive Analytics
   - IoT sensors and predictive analytics algorithms enable early detection of safety hazards, allowing for proactive intervention (Xu et al., 2018).
   - Real-time monitoring systems track worker movements and environmental conditions, enhancing safety management (Zhao et al., 2019).

b) Wearable Technology and Personal Protective Equipment (PPE)
   - Wearable devices equipped with sensors monitor vital signs and detect hazardous gases, enhancing worker safety (Xu et al., 2018).
   - PPE integrated with IoT technology provides real-time feedback to workers, promoting adherence to safety protocols (Zhao et al., 2019).

c) Automation and Remote Operation with Robotics
   - Autonomous vehicles and robotic systems reduce the need for human workers in hazardous environments, minimizing the risk of accidents (Sikich et al., 2020).
   - Remote operation and control centers enable centralized monitoring and timely response to safety incidents (Xu et al., 2018).

d) Virtual Reality (VR) and Augmented Reality (AR) Training

- Virtual Reality (VR) and Augmented Reality (AR) technologies revolutionize safety, efficiency, and decision-making in the mining industry.
- VR simulations enable realistic safety training, enhancing awareness and reducing accidents. They provide immersive experiences, simplifying complex terrain interpretations without specialized training, as demonstrated in Figure 22-24.
- Geospatial data transforms into VR visualizations, fostering better analysis and collaboration throughout the mining lifecycle. AR offers enhanced accuracy in operations, improved safety, efficiency, and interactive training for workers. Implementing these technologies ensures smarter, safer, and more efficient mining practices, optimizing productivity and reducing risks.

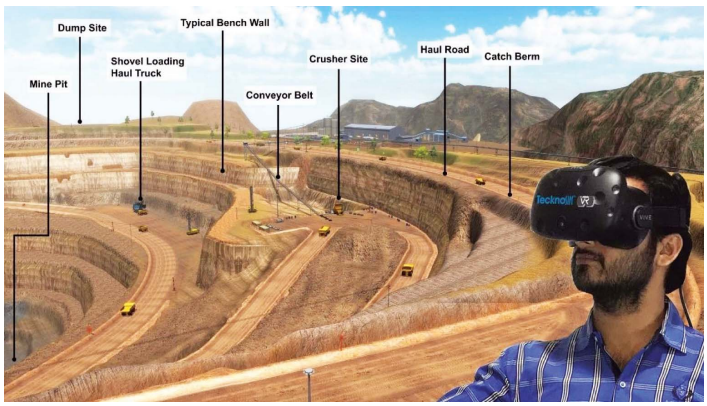


Figure 22: *VR Applications in Mining Industry*

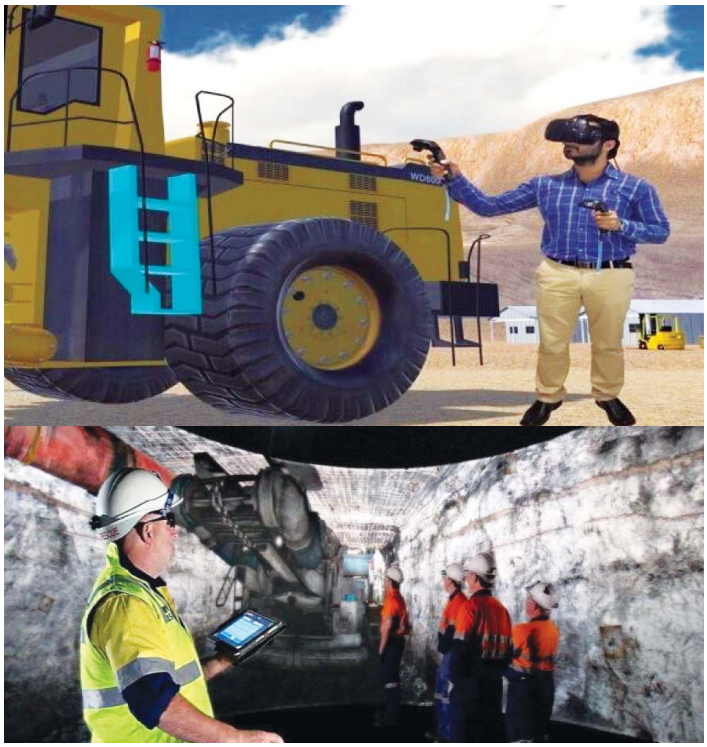
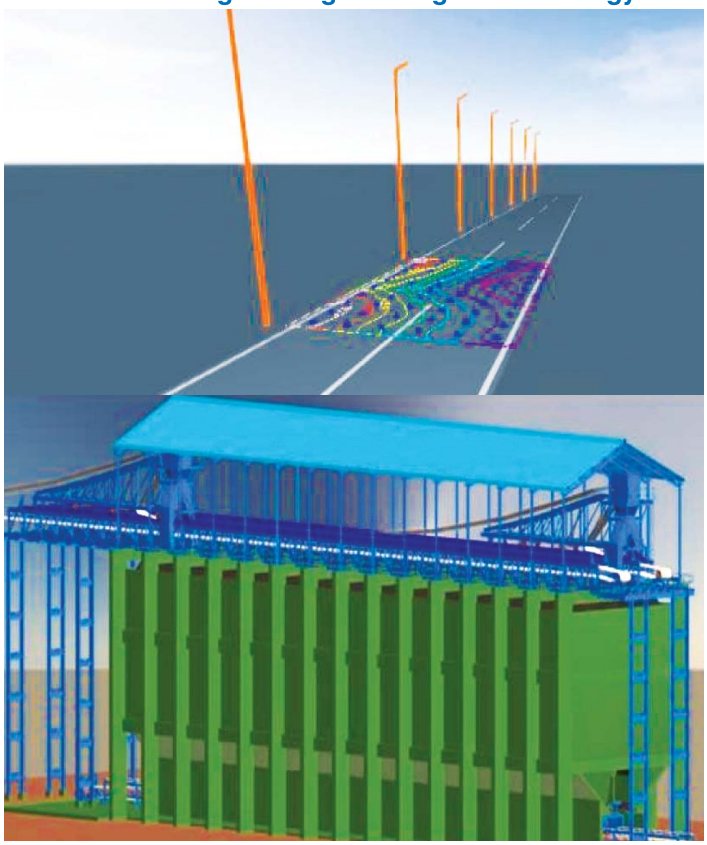


Figure 23 & 24: *VR & AR Applications in Machinery Training and Safety*

2.4 Advanced Engineering with Digital Technology



Figures 25 & 26: *Illumination and Coal Bunker Design in DIAlux and AutoDESK Navisworks*

- In the engineering services of mine planning, software applications play a pivotal role. DIALux, for instance, is essential for lighting design, ensuring optimal illumination to enhance safety and productivity within mining facilities as shown in figures 25.
- Software tools like AutoCAD and Navisworks facilitate construction sequence simulation by integrating 3D models from various disciplines, streamlining coordination efforts, as shown in figures 26.
- Revit enables comprehensive design modeling and documentation, while Bently supports finite element analysis (FEA) for assessing structural integrity.
- SlideWinder streamlines pipeline design with hydraulic, stress, and flexibility analysis, aiding material selection and cost optimization, ensuring reliable, efficient, and cost- effective solutions.
- These software solutions collectively enhance efficiency, accuracy, and collaboration in engineering services, crucial for successful mine planning and implementation.

3. CONCLUSION

Digital transformation is reshaping the mining industry, offering unprecedented opportunities to improv2.1e safety, efficiency and sustainability. By embracing advanced technologies and innovative approaches and leveraging advanced technologies such as IoT sensors, AI and data analytics, mining companies can overcome traditional challenges and pave the way for a more sustainable and resilient future with enhanced safety, productivity and efficiency while minimizing environmental impact, allowing companies to identify inefficiencies and implement corrective measures swiftly. These technologies enable real-time monitoring of equipment, predictive maintenance and optimized resource utilization. Prominent benefits of digital transformation in mining industry are as follows:

- LRMS provides crucial data for land suitability, environmental assessment, community engagement, and infrastructure planning, enhancing sustainability and regulatory compliance in mine planning.
- Numerical modelling enhances mine planning by offering crucial insights into geotechnical properties, slope stability, and environmental impacts, facilitating informed decision-making and sustainability considerations.
- Hydrogeological analysis, supported by numerical modelling, is indispensable in mine planning. It ensures stability, guides dewatering strategies, and mitigates

environmental risks for sustainable water management practices.

- Software applications play a crucial role in environmental monitoring, regulatory compliance, and stakeholder engagement in mine planning. They enable efficient water management through real-time monitoring, data analysis, and informed decision- making, enhancing sustainability and regulatory compliance
- AI-ML techniques are greatly beneficial in developing blasts designs based on geo- structural knowledge in order to achieve superior blasts in terms of fragmentation and ground vibration. Machine learning-based software is extremely beneficial for developing, simulating and forecasting blast consequences.
- Automation, remote monitoring, IoT, and big data analytics enhance operational efficiency and predictive maintenance in mine planning, ensuring informed decision- making.
- Real-time monitoring, predictive analytics, wearable technology, automation, and virtual reality enhance safety, efficiency, and decision-making in mine planning, ensuring smarter and safer practices.
- Software applications in engineering services of mine planning, like DIALux, AutoCAD, Navisworks, Revit, Bently, and SlideWinder, enhance efficiency, accuracy, and collaboration, crucial for successful mine planning.

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LETTER TO THE EDITOR

Indiscriminate Attitude Toward Mining Professionals

This refers to the proceedings of the recently held National Conference at Hyderabad (Ref: MEJ March 2025 issue).

It is gratifying to note the comments of eminent personalities like Shri Joydeep Das Gupta, who stated that "the mining industry remains the backbone of national progress, playing a pivotal role in economic development." This aligns with the key takeaways summarized by Dr. S.K. Sinha in clauses 2, 3, and 4, where he mentioned: "Minerals are not just raw materials; they are the building blocks for our future economy. Mining has a direct link to every aspect of modern life. We must ensure that our mining sector contributes to the nation's development in a balanced and sustainable manner. For Vikasit Bharat, we must ensure that our mining sector contributes to the nation's development in a balanced and sustainable manner. By focusing on these areas, we will be able to fuel economic growth, create jobs, ensure energy security, and promote a cleaner, greener future."

While these points are well-articulated, it is regrettable to note that, as usual, there was a gross failure to acknowledge the most important factor—the "engine driver"—the hard-working yet discriminated-against mining professional. These professionals bear the immense burden of propelling India's progress while other professionals, whose work depends on mining professionals, enjoy better amenities and perks. On one hand, there is a demand for high-quality professionals to manage high-risk mining operations and advance the mining industry for national prosperity. On the other hand, there is no mention of how to attract talent to mining educational institutions.

As you are aware, students often join mining courses only when they fail to secure admission in other engineering disciplines. Even after completing their studies, they must struggle for several years before qualifying for a decent Mine Manager position—something that is not as challenging in other engineering fields. The irony is that without the high-risk efforts of mining engineers in producing minerals and metals, other engineers would not have jobs to sustain themselves. Unfortunately, there has been no serious attempt by either the mining fraternity or the government (due to a lack of advocacy) to accord due recognition and weightage to the contributions of mining professionals.

Referring back to the conference summary: "As we move towards Vikasit Bharat 2047, we must harness mineral wealth in a way that benefits the nation." While this is undoubtedly correct and reflects the way forward, it is equally important to make mining careers attractive for future generations. This will ensure that talented students are drawn toward this field and can contribute effectively to achieving national objectives.

It is requested that MEAI take this issue seriously and engage with appropriate authorities. Future mining engineering students and their families will be ever grateful if initiatives are taken now. MEAI can take pride in doing the right thing at the right time for the benefit of the nation.

Suggestions for Recognition and Benefits

Recognition could include concessional benefits such as priority or discounted railway/flight tickets, seat reservations for children of serving mining professionals in premier institutes, and other measures as formulated by an exclusive committee. These steps will make mining engineering courses more attractive for talented students.

Regards,
PK Govindaswamy, Life Member: 628
March 15, 2025

MEAI NEWS

MEAI HEADQUARTERS

MEAI/NACRI meetings with the Government officials in New Delhi on 20-21 March 2025

Meeting with Shri G Kishan Reddy, Minister of Coal and Mines (L-R): S/Shri Ravi Sharma, Vineet J. Mehra, G. Kishan Reddy, Dhananjaya G. Reddy, PV Rao, Shameek Chattopadhyay

Meeting with Hon'ble Mines Minister Shri G. Kishan Reddy

A meeting was held on 21st March with Shri G. Kishan Reddy, Union Cabinet Minister, Ministry of Coal and Mines; Shri Ravi Sharma; and Shri Vineet J. Mehra, along with NACRI members Dr. PV Rao, Shri Dhananjay Reddy, and Shri Shameek Chattopadhyay in his office at Parliament Bhavan. He acknowledged the need to focus on IMIC adoption in India. Due to the ongoing parliamentary session, he spent only a few minutes but assigned two IAS officers to further discuss the matter and gain a better understanding before preparing a note for him. During the discussion, all their queries were addressed, and a copy of the presentation for NITI Aayog was handed over to them.

Meeting with Dr VK Saraswat, Hon'ble Member (S&T), NITI Aayog (L-R): S/ Shri Vineet J. Mehra, Ravi Sharma, Dr VK Saraswat, Afroz, Shanto Mukherjee, PV Rao, Dhananjaya G. Reddy

Meeting with Dr VK Saraswat, Hon'ble Member (S&T), NITI Aayog (L-R): S/ Shri Shameek Chattopadhyay, Ravi Sharma, Dr VK Saraswat, Afroz, Shanto Mukherjee, PV Rao, Dhananjaya G. Reddy, Ishtiyaque Ahmed (NITI Aayog)

Meeting with Dr. V.K. Saraswat, Hon'ble Member (S&T), NITI Aayog

A meeting was held on 21st March with Dr. V.K. Saraswat, Shri Ishtiyaque Ahmed, Shri Ravi Sharma, and Shri Vineet Mehra, along with NACRI members Dr. PV Rao, Shri Dhananjay Reddy, Shri Shameek Chattopadhyay, Shri Shanto Mukherjee, and Shri Afroz from MTCS (Adani Group) at NITI Aayog's office. Dr. Saraswat devoted sufficient time to discussing IMIC adoption in India, raising several detailed queries about the subject matter. He clarified that this issue would need to be addressed by the Mines Secretary through amendments to MEMC Rules and subsequent Cabinet approval. Dr. Saraswat advised MEAI/NACRI to prepare a concise two-page note summarizing key points in MEMC Rules requiring modifications based on IMIC principles and highlighting the potential advantages of adopting IMIC. He assured us that after reviewing this note, he would send recommendations to all relevant stakeholders to ensure its logical conclusion.

Discussion with the Mines Secretary, Shri V.L. Kantha Rao during Critical Inter-Ministerial Group meeting

Shri Ravi Sharma and Shri Vineet J. Mehra met the Mines Secretary on 20th March in his office. The matter of adopting IMIC in India was discussed during the meeting, and the Mines Secretary assured that this topic is high on his agenda and that he intends to conclude it at the earliest opportunity.

Besides the above, the team is also working with very senior officials at the highest possible level. Meetings were held with them as well. The names are not disclosed until we reach a logical end to this in the next six months, with regular follow-ups.
Prepared by

Rao PV Dr FAusIMM
Co-Chair NACRI

BELLARY-HOSPET CHAPTER

National Seminar – Surveyors' Meet-2025

Date: 8th March 2025
Venue: Hotel Malligi, Hosapete
Participants: 120

Chief guest: Shri. Bipul Bihari Satiyar, Director of Mines Safety, Ballari Region-I

Guests of honour: Shri. Yohan Yejerla, Director Of Mines Safety, Ballari Region-II, Kum. Dwithiya EC, Deputy Director, DMG, GoK, Dr. Meda Venkaiah, Director, M/S MSPL Limited, Shri. K Madhusudhana K, CEO M/S MSPL Limited, Shri. Narsaiah M, Secretary General, MEAI, Shri. Mallikarjuna

SHM, Chairman BH Chapter, Shri. P Venkateswara Rao, Secretary BH Chapter

The inauguration ceremony was graced by esteemed dignitaries, including Shri. Bipul Bihari Satiyar, Kum. Dwithiya, Shri. Yohan Yejerla, who cut the ribbon to mark the official opening of the exhibition. The stalls showcase cutting-edge technologies, innovative tools, and the latest advancements in surveying equipment, software, and solutions. Attendees can explore a wide range of products and services, interact with experts, and gain insights into the future of the surveying industry.

The exhibition stalls highlighted cutting-edge technologies, with a particular focus on the transformative role of drone technology in modern surveying practices. Attendees were treated to live demonstrations and interactive displays, offering a glimpse into how drones are revolutionizing data collection, mapping, and precision in the surveying industry.

Inauguration of Stalls by Dignitaries

Shri. Mallikarjuna SHM extended a warm welcome to all the participants, distinguished guests, and experts present at the Surveyors' Meet-2025. He expressed his heartfelt gratitude to the Mining Engineers Association of India for organizing the event, recognizing it as an important occasion for the exchange of valuable insights and experiences in the field of surveying, which is an integral part of the mining industry. As he pointed out, the collaboration between mining engineers and surveyors is critical for the successful execution of projects. Effective surveying ensures the proper planning and execution of mining operations, which, in turn, impacts overall productivity, sustainability, and environmental safety.

As part of the inaugural ceremony of the Surveyors' Meet-2025, organized by the Bellary-Hospet Chapter, the traditional lighting of the lamp was conducted with great reverence and enthusiasm. The lighting of the lamp symbolizes the removal of darkness and the ushering in of knowledge, wisdom, and positive energy for the successful commencement of the event.

Shri. Yohan Yejerla, graced the event as a Guest of Honour and delivered an engaging and thought-provoking address. His vast experience in mining safety, regulatory compliance, and industry practices provided invaluable insights to the audience of surveyors, engineers, and industry professionals. his address by acknowledging the significant role surveyors play in the mining industry. He emphasized that surveyors are not just technicians but crucial stakeholders who ensure the success and safety of mining operations.

Kum. Dwithiya began her address by acknowledging the importance of youth participation in the profession. She emphasized that the next generation of surveyors plays a crucial role in the growth of the industry, particularly as new technologies and methodologies continue to reshape the field. She encouraged young professionals in the audience to embrace challenges, think creatively, and seize opportunities to contribute to the evolving landscape of surveying.

At the Surveyors' Meet-2025, Shri. Madhusudhana K, the Chief Executive Officer (CEO) of M/s MSPL Limited, delivered a remarkable address that resonated with industry professionals, surveyors, and engineers in attendance. With his wealth of experience in the mining and business sectors, his address focused on the importance of innovation, collaboration, and sustainable practices within the mining and surveying industries. Highlighted the crucial role of innovation in the mining and surveying sectors. He spoke about how the industry is evolving with the rapid integration of new technologies.

As part of the Surveyors' Meet-2025, a special felicitation ceremony was held to honor and recognize the exceptional contributions of senior professionals in the field of mine surveying. The event, attended by industry leaders, surveyors, and engineers, was a momentous occasion to express gratitude and admiration for those who have played a key role in shaping the mining surveying profession.

Shri. Bipul Bihari Satiyar's address clearly captured the essence of the challenges and opportunities within the mining industry. By emphasizing the critical role of surveyors, he reinforced the fact that their expertise is indispensable for ensuring the accuracy and success of mining projects. His focus on innovation reflects the growing demand for cutting-edge technologies to improve efficiency and safety in the field. Moreover, his call for sustainable practices highlighted a much-needed shift toward environmental responsibility, ensuring that the industry continues to grow while minimizing its impact on the planet. His words surely inspired those present to think more critically about the future of their work and its wider implications.

On Women's Day, the Surveyors' Meet 2025 celebrated the accomplishments and contributions in Various industries. As part of the event, two distinguished Dept of Mines & Geology professionals, Kum. Dwitiya E C and Smt. Mamata, were felicitated for their work, leadership, and dedication.

Shri. P. Venkateswara Rao began by expressing his deepest gratitude to the Chief Guest, Shri. Bipul Bihari Satiyar, and all the dignitaries who graced the event with their esteemed

presence. He acknowledged their invaluable contributions and impactful addresses, which set the tone for a productive and insightful gathering. The session concluded with a heartfelt Vote of Thanks delivered by Shri. P. Venkateswara Rao, the Secretary of the BH Chapter.

The Director of Mines Safety, Shri Yohan Yejerla presented the paper on Surveying & Preparation of the Mine Plans – Statutory Obligations. In his deliberations, he explained the basic requirements, purpose, use and the importance of survey & plans by considering the various case studies. In his presentation, he insisted about the skill requirements like geological expertise, proficiency in the Mining Software, IT & GIS, analytical & problem-solving abilities, knowledge of legislation & Regulations, data interpretation, technical expertise in survey instruments that a surveyor must possess to understand and represent the practical workings on the plan.

Shri. Piyush Rana GM – Business Development, Aereo presented the paper on Safer, Smarter and More Sustainable Mining Through Drones and AI Analytics. He explained about the drone developments happening in India and explained end to end AI-Powered Cloud Solution. In his deliberations, he explained the challenges in AI Driven data processing & Analytics and also explained about the unaddressed challenges in the system. The presentation provided the insight of the solutions provided by the Aereo in line with drone and also about the other modules with respect to Productivity and efficiency in blasting operations, Blast Optimization, Blast Information Management, Improved Safety, tailored tools for Mining process etc., The presentation included the detailed demo about the working of the modules which was very interesting and fascinated.

Shri. Maris Vignesh S from Unitos Aero Drone Solutions briefed about the trends in surveying, the data integration & Management & drone-based Photogrammetry with reference to case studies. He explained about the applications of drone in the present scenario which includes Real estate & Construction, Land and Revenue, Road and Highways, Railways, agriculture etc., He also explained about the transformation that has taken place after the introduction of Drone in various activities like stockpile Management, Monitoring & Operation Planning etc.

Shri. Ravikumar from Infycons Creative Software Pvt Ltd briefed about the auto plotter, Software that makes the entire process of land surveying efficient and also Integrates with industry adopted instruments and formats. He demonstrated the working of the module which will help user in Surface and contour generation, accurate volume calculation, longitudinal and cross section, Automated cadastral map creation, Orthoimage support (GIS module), Traverse correction etc., In additional to this, he also explained how this system is useful for the surveyors. He explained about his other modules and also add-on modules which will benefit the company as a whole.

Shri. Rahul from polygongeo presented a paper on Advanced Integration of Drones, LiDAR, Satellite Data, AI/ML, and IBM Guidelines for Mineral Mine Management. In his deliberation he explained Geospatial Solutions in Mining,

Role of UAVs in Mining Operations and deliverables of the modules developed by the polygongeo. He explained about the LIDAR technology which is precise for terrain mapping and also Optimizing Resources through Accurate Volume Measurement.

Shri. Lohith Kumar delivered an insightful presentation on the topic "The Applications and Importance of Drone Survey in the Mining Industry." Shri. Lohith Kumar, an expert in the integration of drone technology in industrial applications, explored the growing role of drones in mining and highlighted the multiple ways in which drones are transforming surveying practices within the industry.

Shri. Ashish Kumar delivered a comprehensive presentation on the topic "Conventional & Modern Survey Techniques." In his session, Shri. Ashish Kumar delved into the evolution of surveying methods, comparing traditional techniques with modern advancements and the significant impact these developments have had on the accuracy, efficiency, and safety of surveying in the mining industry.

Featured an insightful address by Shri. Dhruva Kumar, one of the esteemed Guests of Honour. His address highlighted the crucial role of surveyors in the mining industry and the significant contributions that modern surveying technologies make to the safety, accuracy, and efficiency of mining operations.

Dr. Sharath Kumar P as one of its esteemed Guests of Honour. In his address, Dr. Kumar shared his insights on the evolving landscape of surveying technologies and their importance in the mining industry, while also emphasizing the critical role of innovation and collaboration in shaping the future of the industry. Also urged to conduct a mineral processing engineers' meet in upcoming days.

Delegates from various organizations, including MSPL Limited, SKMEPL, BKG Private Limited, NMDC Limited, JSW Steel Limited, R Praveen Chandra, Vedanta, RBSSN, M/s KSMCL, VESCO, Sagar Cements, Tata Steel, and others, along with 10 representatives from the Department of Mines and Geology, also participated in the surveyors' meeting.

Shri. Ashok, Senior Surveyor from the Department of Mines and Geology, expressed his gratitude towards the Mining Engineers' Association for organizing the Surveyors' Meet. In his deliberations, he also highlighted the efforts being made by the Department of Mines and Geology. He informed the audience about the 15 points established by the department, which will assist surveyors in referring to permanent points. Additionally, he emphasized that surveyors should be given adequate time to prepare accurate plans.

The representative from NMDC also expressed a positive opinion about the Surveyors' Meet. He suggested that such events should be held regularly across different verticals

The Chairman & Secretary recognized the efforts of the organizing committee members. Shri. Santosh Shiraganvi, Shri. Rakesh MM, Shri. Jitendra Reddy, Shri. Ravindra S, were presented with a momento for their effort in organizing the surveyors' Meet, the program was anchored by Shri. Rakesh MM.

Recent advancements in hydroclone technology

Date: 20.2.2025

Guests of Honour: Sri P Venkateswara Rao, Secretary, B H Chapter, Mr. M S Raju, Senior Mining Engineer, and Technical Consultant, Dr. P Sharath Kumar, Department of Mineral Processing, VSKUPG Centre, Nandihalli, Mr. Bharath and Mr. Satvik from CUMI Pvt. Ltd.

The event aimed to provide a platform for mining and mineral engineers of the Bellary region to learn about the latest advancements in Hydrocyclone technology. The event was designed to facilitate knowledge sharing, networking, and collaboration among industry professionals.

Prof. Arun K Majumdar, Professor at IIT Kharagpur, was invited to deliver a talk on "Advancements in Hydro cyclone Technology". Prof. Majumdar's expertise in mineral processing and hydro cyclone technology provided valuable insights to the participants. Prof. Majumdar's presentation covered topics such as: Principles of hydro cyclone operation, Design and optimization of hydro cyclones, Applications of hydro cyclones in mineral processing, and Recent advancements and future directions.

Engineers from local mineral beneficiation plants, including MSPL, SMIORE, NMDC, VESCO, and RPCL, JSW have been benefited from this event. The event concluded with the felicitation of Prof. Arun Majumdar and Mr. Bharath by Sri PV Rao, Secretary B H Chapter. A vote of thanks was rendered by Sri PV Rao, expressing gratitude to the speakers, participants, and organizers. The event was compiled by Sri Sumanth, Mining Engineer from SKME Pvt. Ltd. The Tecxchange event on Advancements in Hydrocyclone Technology was a resounding success. The event provided valuable insights to participants, facilitated networking and collaboration, and contributed to the growth and development of the mining and mineral processing community in the Bellary region. MEAI B H Chapter plans to organize more such events in the future to promote knowledge sharing and collaboration among industry professionals.

RAIPUR CHAPTER

Minutes of the Meeting held on 31.1.2025

The Mining Engineers Association of India has been formed to bring together all professionals of the mining fraternity including mining engineers & geologists and persons associated with mining allied activities and acts as a platform for knowledge sharing and for updating knowledge on latest amendments and technologies developed in mining industries. With the above concept, Mining Engineers' Association of Raipur chapter commenced.

However, due to various reasons including pandemic situation, the activities of the association have reached a dormant stage. In order to resume the activities of the MEAI, Raipur Chapter, a meeting was called upon by Shri Prem Prakash, RCOM, IBM, Raipur region in presence of Shri B.L. Bhati, the Chairman MEA, Raipur chapter and officers of regional office, Indian Bureau of Mines, Raipur. Following points emerged based on detailed discussion on modalities to enhance the activities of MEAI in Raipur.

- Formation of a new governing body with RCOM, IBM, Raipur as the Chairman of Raipur chapter.
- Senior industry personnel like Shri C. Shrikant, CGM, SAIL as Co-Chairman
- Shri Sandeep Singh, GM, M/s ACC as Secretary
- Shri Dinesh Singh, Manager (Mines), M/s ACC as Treasurer
- The list of organising members was also reviewed and a list of members was also prepared.
- It is also proposed to hold the next meeting of the Raipur Chapter on 14.2.2025.
- It was decided to hold a meeting on a quarterly basis for knowledge sharing among mining personnel.

RAJASTHAN CHAPTER-UDAIPUR

International Conference Report

Event Title: 'Future of Mining: Digital Empowerment and Youth-Driven Sustainability' 'By Students, For Students'
Dates: 22-23 February 2025
Venue: College of Technology and Engineering (CTAE), Maharana Pratap University of Agriculture and Technology (MPUAT), Udaipur
Organized By: Rajasthan Chapter - Udaipur Student Chapter in collaboration with CTAE, MPUAT

The international conference titled 'Future of Mining: Digital Empowerment and Youth-Driven Sustainability' concluded with grand success on 23rd February 2025 at CTAE, MPUAT, Udaipur. The event aimed to promote technological innovation, sustainability, and the active participation of young talent in the mining sector. The unique theme of 'By Students, For Students' set this conference apart, providing a platform for students to lead, present, and learn from industry experts.

Inaugural Function

Chief Guest Sh Deepak Tanwar, Director, Dept Mines & Geology, Government of Rajasthan addressing the gathering

President MEAI Sh SN Mathur addressing in the Inaugural Function

President MEAI receiving a memento from Sh Arun Kothari

Day-One Highlights

The conference began with a warm welcome by Organizing Secretary, Dr. Hitanshu Kaushal, who outlined the objectives and key themes of the event. The Chief Guest, Mr. Deepak Tanwar, Director, Department of Mines and Geology, Government of Rajasthan, and Special Guest, Mr. Sunil Joshi, Dean of CTAE, MPUAT, offered valuable insights. The event was presided over by MEAI National President, Mr. S.N. Mathur.

Shri Asif M. Ansari, Convener and Secretary of the Rajasthan Chapter - Udaipur, highlighted the chapter's initiatives and emphasized the significance of the 'For the Students, By the Students' concept. He noted that the chapter seized this opportunity to host one of the largest and most impactful programs of its kind.

The conference featured keynote lectures from national and international experts, technical paper presentations by students from IITs, NITs, and other prestigious institutions, and insightful panel discussions. Key topics included AI and robotics in mining, sustainable practices, digital transformation, policy frameworks, and community engagement through technology.

Day-Two Highlights

The closing ceremony was graced by Chief Guest Mr. S.N. Mathur and Session Chair Dr. Anupam Bhatnagar, who inspired participants with their addresses. Organizing Secretary Dr. Hitanshu Kaushal delivered the vote of thanks, while Co-Convener Dr. Vikram Seervi presented a detailed report on the conference outcomes.

Over 50 technical research papers were presented, which were divided into four sessions led by students and research scholars from different prestigious institutes all around the country.

The event saw participation from researchers representing institutions such as IIT BHU Varanasi, IIT Kharagpur, MBM University Jodhpur, University of Kerala, AKS Satna, and others, including international delegates. Discussions focused on topics like machine learning in mining, advancements in surface mining processes, youth participation, app development for blast-induced ground vibrations, drone-based mineral mapping, and the role of AI in safe mining practices.

Technical Session Chaired by Industry Experts, Professor and Students

Expert Contributions

Session Chairs, including Dr. S.C. Jain, Mr. R.C. Purohit, Dr. S.K. Vashisth, Mr. M.S. Paliwal, Mr. D.D. Shripath, Dr. Vikram Seervi, Mr. R.P. Mali, and Sh. Arif M. Sheikh provided valuable guidance to researchers. Their expertise helped enhance the quality of the presented work and encouraged young engineers to innovate and contribute to the mining sector.

Conclusion

The international conference concluded on a high note, offering participants valuable learning experiences and networking opportunities. Dr. Hitanshu Kaushal expressed gratitude to all dignitaries, the organizing team, and participants for their contributions to making the event a grand success. Special thanks were given to MEAI National President Mr. S.N. Mathur for giving the Udaipur chapter this opportunity, MEAI Rajasthan-Udaipur Chapter Chairman Mr. Praveen Sharma, and Secretary Asif M. Ansari. The conference is expected to inspire the younger generation to pursue innovation and sustainability, contributing positively to the future of the mining industry.

List of Institutes/ Companies participated in the Program

1. IIT (BHU), Varanasi, India
2. BIT Sindri, Dhanbad, Jharkhand India
3. College of Technology and engineering, Udaipur
4. SPSU, Udaipur, Rajasthan, India
5. Gujarat Mineral Research & Development Society, Commissioner of Geology & Mining, Gandhinagar, Industries & Mines Dept., Govt. of Gujarat
6. Department of Geology MLSU, Udaipur- 313001
7. Sangam University, Bhilwara-311001
8. MBA Finance with Digital Marketing (Final year student), MIT-WPU, Pune (Maharashtra)
9. M.B.M. University, Jodhpur
10. Jharkhand Rai University, Ranchi Jharkhand 834010
11. Shri Rawatpura Sarkar University, Raipur (C.G.)
12. Government Polytechnic, Bhuj (Kutch, Gujarat)
13. Bhagwant University
14. Indian Institute of Technology Kharagpur West Bengal – 721302
15. *M.Sc. Geology, University of Kerala, Trainee Geologist, H K & Associates, M. Tech., Ph.D. (Mining Engineering), CEO, H K & Associates
16. The Safety X Bangalore India, Associate at Hindustan zinc ltd
17. AKS University, Satna (MP)

FEMMI'S NATIONAL CONFERENCE ON MINOR MINERALS MINING

The Federation of Minor Minerals Industry (FEMMI), in collaboration with NITI Aayog, the Ministry of Mines and Mining Engineers' Association of India, has hosted the National Conference on Opportunities and Challenges in Minor Minerals Mining at Novotel Hotel, Vijayawada on March 7, 2025.

Dr. V.K. Saraswat, Hon'ble Member, NITI Aayog – delivering the keynote address has said that despite the Minor Minerals having more GDP and GVA than major minerals did not have enough focus and he contended that there should not be any distinction between major and minor minerals.

He advocated a national minor mineral policy, one nation one minor mineral policy and one Nation, one Mineral

one royalty and the required changes are pipeline in NITI Aayog and were discussed in IMC and are in pipeline. He advocated section 15, and 15(A) amendments in the MMDR Act to facilitate uniform taxation and bring rationalization of minor mineral taxes. He said there should be a single window policy to curtain delays in obtaining all the statutory clearances.

He advocated Export Promotion Council for Minor Minerals.

He said FEMMI and NITI Aayog is conducting this conference to highlight issues that need to be addressed to bring Minor minerals into national building as part of Atmanirbhar Bharat 2047.

DR. C.H. Rao and P. Rama Krishna of FEMMI have highlighted that the minor mineral sector plays a crucial role in India's infrastructure, construction, and manufacturing industries, supporting millions of livelihoods and generating significant state revenues. However, the industry is facing major setbacks due to regulatory inconsistencies, excessive taxation, delayed environmental clearances, and policy paralysis.

Dr. C.H. Rao contended while Addressing inconsistencies in state and central laws and proposing a uniform minor mineral policy. Taxation Reforms: Evaluating the impact of competitive populism and excessive levies that burden the industry. Mineral Concession Policies: Debating the Auction vs. First-Come-First-Served (FCFS) models for leases. Fast-Tracking Approvals: Simplifying environmental clearances and mineral exploration policies. Showcasing State Best Practices: Encouraging uniform policy implementation across all states.

Dr. C.H. Rao has highlighted the cartelization in certain minerals and especially brought the issues related to the stoppage of permits to the Quartz, mica mines in Nellore sector. He opined that bringing quartz, mica, feldspar, Barytes from minor to major is a right move by the centre.

This Conference is Critical because,

- 50% of minor mineral mines across all Indian states are non-operational due to bureaucratic delays.
- Unscientific auction policies have inflated costs, leading to arbitrary mineral valuations.
- Andhra Pradesh alone has 2,018 inactive leases, affecting thousands of workers.
- 450% rise in taxation has crippled small and micro enterprises in the sector.
- Cartelization of Mineral ecosystem; EX. Quartz-Mica in Nellore Dt and Silica sand in Gudur Dt.
- Illegal mineral transport and policy gaps continue to impact revenue and market stability.

This conference is expected to kick start concrete reforms in the industry, leading to: A roadmap for a National Minor Minerals Policy ensuring consistency in regulations. Tax rationalization strategies to balance industry growth and government revenues. Already FEMMI has participated in the Inter-Ministerial Committee meeting held by NITI -Aayog and presented the case for One Nation, One Mineral, One Tax agenda and it needs to go to parliament for enactment of MMDR Act amendments.

Stronger coordination between state and central authorities for smoother policy execution. Fast-tracked permit approvals, reducing bureaucratic delays and reviving dormant mines. Robust monitoring mechanisms to curb illegal mining and improve compliance.

As India moves towards its 2047 industrial vision, minor minerals must be prioritized for economic sustainability. This conference marks a critical milestone in shaping a transparent, efficient, and investment-friendly mining sector.

Ministry of Mines organised Celebrating Women in Mining Sector

In a function organised by the Ministry of Mines, on 6th March at Hyderabad, to recognise the contribution of women in the Mining Sector, Hon'ble Union Minister for Coal and Mines, Shri G Kishan Reddy, Hon'ble Union Minister of State for Coal and Mines, Shri Satish Chandra Dubey and Hon'ble Minister for Women and Child Welfare, Telangana, Smt. Anusuya Seethakka recognized women Achievers from all over the country. Ms. Gunjan Pande, GMDC Ltd and Secretary, Ahmedabad Chapter, Ms. Tanvi Thakkar, GMDC Ltd and Five employees of Noamundi Iron Mine of Tata Steel Limited working in the all-women's shift were recognised in this event as Women Achievers.

Ms. Disha Ramesh Khade, Manager Mining, Ms. Mahima Tripathi, Manager Mining, Ms. Rewati Purty, Operation Assistant Shovel, Ms. Taneshwari Nayak, Operation Assistant Shovel, Ms. Durgi Majhi, Operation Assistant HMEO were recognised as Women Achievers for Noamundi Iron Mine.

Ms. Gunjan Pande, Secretary, Ahmedabad Chapter receiving Award from Shri. G. Kishan Reddy, Hon'ble Union Minister for Coal and Mines, Govt. of India and in the picture Smt. Anusuya Seethakka, Minister of Women and Child Welfare of Telangana and Shri. Satish Chandra Dubey, Hon'ble Union Minister of State for Coal and Mines, Govt. of India.

(Continued from Page 12)

Meanwhile, India's Mines Minister G Kishan Reddy said the country has decided to explore lithium reserves in Jammu and Kashmir and clarity on this is expected by May 2025. The government in February 2023 found its first lithium deposits in Jammu and Kashmir with estimated reserves of 5.9 million metric tons, but has failed to get any bids to auction mining rights in the state.

In 2023, India identified over 20 minerals, including lithium, as "critical" for its energy transition efforts and to meet the growing demand from industries and the infrastructure sector.

Reuters NEW DELHI | Feb 27 2025

Ukraine and US partner in critical minerals sector

Recently, President Donald Trump initiated access to Ukraine's critical minerals in return for US military support in a war with Russia. The attraction of strategic investors in the development of critical minerals was also a measure of the Victory Plan, presented by President of Ukraine Volodymyr Zelensky.

Below, I will try to describe which minerals could be a part of a mutually beneficial agreement between Ukraine and the US. The industry of critical raw materials for battery and modern technology manufacturing is one of the fast-growing sectors, where Ukraine can integrate with international and regional value chains, diversifying and de-risking global demand.

Ukraine holds 23 of the 50 strategic materials identified by the US as critical, and 26 out of the 34 recognized by the EU as critically important. Particularly, Ukraine holds very competitive positions in five key ones: titanium, graphite, lithium, beryllium, and REEs. Today, this group of minerals in Ukraine is partially developed and almost not used for the production of metal alloys and finished goods. Currently, there are 30 licenses issued for their development.

Moreover, the Government holds more than 30 unlicensed deposits and about 400 promising occurrences, managing several important industrial assets, which are still capable of fabricating metal titanium, aluminum, silicon, germanium, and gallium.

(Continued on Page 36)

NOMINATIONS FOR MEAI AWARDS 2025

The Mining Engineers' Association of India presents awards Instituted by the Industry/individuals during the Annual General Meeting in July - August every year. Nominations for the following Awards are invited in the prescribed form, so as to reach the Secretary General by **30th April 2025**. Nomination can be submitted by a member for one award only.

1. **MEAI - Sitaram Rungta Memorial Award** for the best paper on Mining-related issues during the year 2024.

Award Bylaws:

a. The award is known as MEAI – Sitaram Rungta Memorial Award, instituted by M/s Rungta Group of Mines.

b. The award is presented to a Mining Engineer/ Geologist or any other qualified person involved with Mining Industry, who presented a paper on mining related issues during the previous calendar year/ financial year.

c. The papers presented in any of the paper meetings, seminars or workshops organized by the Association/ Chapter during the calendar year are eligible for the award, provided
   1. The paper was not published in any journal/ magazine in India or abroad other than the MEJ
   2. The author did not deliver lecture/ talk related to this paper on any other forum other than in the Seminars / Workshops etc., organised by MEAI.

2. **MEAI NMDC Excellence Gold Medal Award** for significant contribution to Mineral Industry during the year 2024.

Award Bylaws:

a. **The award is known as NMDC Excellence Gold Medal Award instituted by M/s NMDC Ltd.**

b. The award is presented to a Mining Engineer/ Geologist or any qualified person involved in Mining Industry for the meritorious services rendered by him/ her to the Mineral Industry of India.

c. The award consists of Gold Medal and a certificate.

d. The Awardee shall be at least 50 years of age and shall have at least 20 years of experience in the Mining Industry.

e. The applicant shall submit required proofs/documents if any for his contribution to the Mining Industry.

f. The Jury for the Award shall consist of CGM and above rank officers from NMDC and two other senior members from MEAI.

3. **MEAI Simminds Award** for significant contribution to the limestone industry during the year 2024.

Award Bylaws:

a. The award is known as MEAI – SIMMINDS award instituted by M/s SOUTH INDIAN MINES AND MINERALS INDUSTRIES Ltd.,

b. The award is presented to a Mining Engineer/ Geologist or any qualified person involved in Mining Industry for his/ her significant services rendered to the Limestone industry.

4. **MEAI Smt. Bala Tandon Memorial Award** in recognition of contribution to Mining Industry for improving ecology, environment and forestation during the year 2024.

Award Bylaws:

a. The award is known as MEAI - Smt. Bala Tandon Memorial Award was instituted by Padma Bhushan G.L. Tandon in memory of his late wife.

b. The award is presented to a Mining Engineer/ Geologist or any qualified person associated with the Mining Industry, in recognition of his/ her meritorious services for improving ecology, environment and afforestation in mining and mineral industries.

5. **MEAI Abheraj Baldota Memorial Gold Medal Award** (Mining Engineer of the year 2024) in recognition of significant contribution to Mining Industry by a Mining Engineer with 20 years of experience in the Industry.

Award Bylaws:

a. The award is known as MEAI – Abheraj Baldota Memorial Gold Medal Award (Mining Engineer of the year) instituted by M/s MSPL Ltd., in memory of its founder late Abheraj Baldota.

b. The award is presented to a Mining Engineer with a Degree or Diploma in Mining Engineering and Mine Manager's Certificate of Competency with 20 years of experience in mining and allied disciplines as on the date the nomination is forwarded and the nominee should have completed 45 years of age and contributed substantially to the mining and mineral industries in the areas of management performance, production, mining technology, human resource development, protection of environment, mineral conservation, beneficiation etc.

6. **MEAI Abheraj Baldota Memorial Gold Medal Award** (Young Mining Engineer of the year 2024) in recognition of significant service to Mining Industry by an Young Mining Engineer who has not completed 35 years of age as on 2025.

Award Bylaws:

a. The award is known as MEAI – Abheraj Baldota Memorial Gold Medal Award (Young Mining Engineer of the Year) instituted by M/s MSPL Ltd., in memory of its founder late Abheraj Baldota.

b. The award is presented to a Young Mining Engineer with a Degree or Diploma in Mining Engineering or a Manger's Certificate of Competency with five years' experience in mining industry and the nominee should not have completed **35 years of age as on the date of filing his nomination for the award.**

7. **MEAI-SRG Informational Technology Award** for the year 2024, In recognition of significant contribution to Mining Industry adopting Information Technology during the year 2024.

Award Bylaws:

a. The award is known as S.R.G. Award for Information Technology, instituted by M/s S.R.G. Consulting Mining Engineers (P) Ltd. in memory of late Sriram Srinivasan and late Pradeep Kumar Bhattacharya both founder directors who lost their lives in Train (Rajdhani Express) accident in the year 2002.

b. The award is presented to a qualified Mining Engineer/ Geologist/ any qualified person for his significant contribution in Information Technology to Mining and Mineral Industries and the nominee should be a Life Member of the MEAI.

8. **MEAI Master Tanay Chadha Memorial Geologist Award** for the year 2024 in recognition of the significant contribution by a geologist in the field of Mineral Exploration, quality control, and production, mine planning, etc. during the year.

Award Bylaws:

a. The award is known as MEAI – Master Tanay Chadha Memorial

Geologist Award instituted by Shri G.L.Tandon (Padma Bhushan) in the name of his late grandson (S/o Smt. Sunita Chadha and Shri Sudhanshu Chadha). The award is presented to a geologist with a Master's Degree in Geology/ Applied Geology/ Geophysics with at least five years' experience in Mining and Mineral Industry who had contributed significantly in the areas of mineral exploration, quality control and production, mine planning, etc.

9. **MEAI- Smt Veena Roonwal Memorial Award** for the year 2024 to a Mining Engineer/Geologist/a qualified person involved with the Mining Industry with 10 years of experience for presenting a paper during the year in a seminar/ symposium workshop organized by MEAI on "Water Management in and around a working mine" or "Implementation of New/Latest Technology in Mining and allied subjects.

Award Bylaws:

a. The Award is known as Smt. Veena Roonwal Memorial Award instituted by Prof. G.S. Roonwal in memory of his late wife and is presented to a qualified Mining Engineer/ Geologist/ any qualified person involved with Mining Industry with 10 years' experience, for presenting a paper during the year in a seminar/ symposium/ work shop/ technical paper meeting organized by MEAI/ MEAI Chapter on "Water Management in and around a working mine or implementation of New/ Latest Technology in mining.

10. **MEAI- Smt Kiran Devi Singhal Memorial Award** for the year 2024 only to a person (MEAI Member/Non-member- need not necessarily be from mining discipline) for his/her contribution in the field of "Development and Conversation of Minerals and Environment" in and around Metalliferous mines (excluding Coal and oil) during the year 2024.

Award Bylaws:

a. The award is known as MEAI - Smt. Kiran Devi Singhal Memorial Award instituted by Dr. Suresh C. Singhal in memory of his late mother.

b. The award is presented to a member or non-member of MEAI for his/ her outstanding contribution in the field of "Development and Conservation of Minerals and Environment in and around metalliferous mines.

11. **MEAI Award to a best paper in Mining article published in the Mining Engineers' Journal in the financial year 2024 Instituted by Dr. M.L. Jhanwar**

Award Bylaws:

a. a. The Award will be known as Eco-friendly Mining Award.

b. The award consists of a Plaque/ Medal and a Certificate. The cost of the Award will be met from the interest received on the donation of Rs. 1 lakh from Dr. M.L. Jhanwar.

c. The Award will be given to a person for contributing the best paper on Eco-friendly Mining in Mining Engineers' Journal published by MEAI.

d. The Award is presented to a member or non-member of MEAI. The paper should not have been published in any of the journals in Magazines India/ Abroad other than MEJ on Eco-friendly Mining.

12. **MEAI-SCCL Coal Award** for the year 2024 to a Mining Engineer, a Geologist, a Mechanical Engineer and a Foreman/Over man for meritorious contribution to the Coal Industry.

Award Bylaws:

a. The Awards are known as MEAI- SCCL Coal Awards instituted by M/s SCCL Ltd.

b. The Awards are presented to a Mining Engineer, Geologist, Mechanical Engineer, Overman/ Foreman or any qualified person involved in Coal Mining Industry for the meritorious services rendered by him/ her to the coal industry or papers published.

➤ For detailed guidelines please visit the website www.meai.org and the memorandum of association and rules and regulations (as on 26.08.2022)

Applications and Guide Lines

The application (Hard Copy) shall be forwarded/sent to Secretary General MEAI NHQ in Prescribed Format (Copy Enclosed) to reach before **30th April 2025** **(MEAI NHQ Address: Mining Engineers' Association of India, F-608&609, VI Floor, Raghava Ratna Towers 'A' Block, Chirag Ali Lane, Abids, Hyderabad – 500001. Mob – 7780117320) and the Soft copies should be enclosed in PDF format with the subject. MEAI Awards 2025 and shall be sent to email - meai1957@gmail.com**

Applications are to be sent along with enclosed Award Format

MEAI Award Format

1.	Name of the Award Applied for	:
2.	Name of the Applicant	:
3.	Date of Birth	:
4.	Academic Qualification	:
5.	Professional Qualification	:
6.	Whether a Member/Life Member of MEAI	:
7.	Specific details of the award applied for as per requirement of bylaws (Enclose relevant documents)	:

Date: Certify that the information/details submitted for the above Award are true to the best of my knowledge

Name: Signature:

Enclosed copies of documents on experience and achievements.

i. ii. iii.

6th IN-PERSON PROFESSIONAL TRAINING PROGRAM ON IMIC ON 5-9, MAY 2025

Venue: MEAI HQs, Raghavaratna Towers, Abids, Hyderabad 500 001

The Mining Engineers' Association of India (MEAI) has established itself as a prominent professional organization in the mining industry, recognized by both NACRI and CRIRSCO. MEAI focuses on professional development, registering Competent Persons (RCPs), and maintaining ethical standards in the field.

NACRI, acting as India's National Reporting Organization (NRO), has successfully conducted five training programs on the Indian Mineral Industry Code (IMIC) since January 2021, with the most recent one held in May 2024. These programs have seen significant participation from 67 professionals representing various leading mining companies.

The participating companies included Adani Enterprises Limited, BGR Mining & Infra Ltd, Capstone Geo Consultants, Central Mine Planning & Design Institute Limited, DMT Consulting Private Limited, ERM Group, GMMCO Technology Services Ltd, Hindustan Copper Limited, Hindustan Zinc Limited, Hutti Gold Mines Limited, , JSW Steel Ltd, Lloyds Metals and Energy Ltd, M/s. Geeta Rani Mohanty, KSMC Ltd, MECL, MOIL Ltd, MSPL Ltd, NMDC Ltd, OMC Ltd, Singareni Collieries Company Limited, SRK Mining Services (India) Pvt Ltd, Steiger Geoscience and Engineering Pvt. Ltd, Tata Steel Ltd etc. and many others. A list of delegates who attended previous IMIC training programs and subsequently registered or renewed as RCPs can be found on the MEAI website at **www.meai.org**.

On March 20, 2025, MEAI and NACRI representatives met with the Hon'ble Coal & Mines Minister Shri G Kishan Reddy and Dr. VK Saraswat, Member (S&T) NITI Aayog, to discuss the adoption of IMIC in India to attract foreign direct investment in the mineral sector. Efforts are ongoing to gain recognition of IMIC from the Government of India.

About the Professional Development Program on IMIC

NACRI has developed a comprehensive 40-hour (5-day) in-person, non-residential training program on IMIC. The program is structured as follows:

- Conducted by domain experts from India and abroad
- Covers basic knowledge of IMIC, Code of ethics, mineral industry Best Practices, and guidance for prospective RCPs
- Modelled after the JORC Code training program by AusIMM
- Divided into the following major modules:
  - Why the IMIC standard? Context and Principles
  - Exploration Results and Targets reporting
  - How to properly inform Technical Studies to investors
  - Reporting of Mineral Resources
  - Reporting of Mineral Reserves
  - The role of Regulatory Environment

The program aims to educate participants on the obligations and liabilities of Competent Persons under the Indian Mineral Industry Code (IMIC), the role of IMIC in the resources sector, and the correct application of the code. The faculty members are domain experts drawn from both domestic and international mineral industry organizations. Below are the details of the overseas guest faculty members:

1. Mr. Peter Stoker

Position: Deputy Chairman of JORC, Representative of Australasia on CRIRSCO, Treasurer of CRIRSCO, and JORC Chairman (2005–2014). Recipient of the Medal of the Order of Australia for services to the mining industry in 2020. Contributor to *Monograph 23 (Mineral Resources and Ore Reserves Estimation: The AusIMM Guide to Good Practice) and Monograph 30*.
Topic: *The Role of the Competent Person under the CRIRSCO Template*. This includes an examination of variations in requirements for Competent/Qualified Persons across CRIRSCO NROs, Codes of Ethics and enforcement, and the importance of disciplinary processes to the credibility of the CRIRSCO governance system.

2. Dr. Heather King

Position: Group Executive - Geology at A & B Global Xplore, South Africa. Expertise includes economic geology (Ph.D.), exploration, production geology, technical consulting, management consulting, Mineral Resource estimation, and reporting (JORC, SAMREC, CIM - NI 43-101).
Topic: *SAMREC Best Practices in Mineral Exploration for Competent Persons*.

3. Mr. Edson Ribeiro

Position: Past Chair of CRIRSCO and CBRR Brazil Representative on CRIRSCO since 2015. Leads the Exploration and Mineral Projects area at Vale S.A.
Topic: *CBRR Best Practices in Mineral Resources Estimation and Reporting*.

4. Dr. Abani Samal

Position: Former Co-Chair of NACRI and Principal at GeoGlobal, USA.
Topic: *Practical Examples of Mineral Resource Reporting*.

5. Dr. Edmund Slides

Position: Deputy Chairperson of CRIRSCO and Chairman of PERC. Currently works as an independent consultant with his company Orebody Risks Limited.
Topic: *Consideration of Risk and Uncertainty Aspects in Mineral Projects*. This includes discussions on the CRIRSCO-UNFC relationship, the updated CRIRSCO-UNFC Bridging Document, and effective use of the Table-1 Checklist.

6. Mr. Reno Pessacco

Position: New CIM Representative on CRIRSCO and primary author of CIM Best Practices for MRMR Estimation and Exploration documents.
Topic: *MRMR Estimation and Reporting in the Canadian System*.

7. Mr. Lufi Irwan Rachmad

Position: Secretary of CRIRSCO, Indonesian Representative on CRIRSCO, Director and Principal at GEOMINE Mining and Geotechnical Consultant, Coordinator for PERHAPI (Indonesian Association of Mining Professionals), and Member of Komite Bersama (Kombers) KCMI.
Topic: *Reporting Mineral Reserves – A Team Approach*.

IMIC Training Venue

The 6th IMIC in-person training program is scheduled to take place from May 5 to May 9, 2025, at the state-of-the-art conference facilities available at MEAI Headquarters in Hyderabad. The course fee includes a working lunch for all five days, tea and snacks twice daily, and a dinner on the inaugural evening.

IMIC Course fee Payment details

- **Fee for MEAI Members**: Rs 25,000 (Rupees twenty-five thousand only) plus applicable GST @18%.
- **Fee for Other Delegates**: Rs 30,000 (Rupees thirty thousand only) plus applicable GST @18%.

Payments can be made online to the following account:

- **Account Name**: MEAI-National Core Committee Fund
- **Bank Name & Address**: UCO Bank, Abids Circle, Hyderabad
- **S/B Account No**: 14410110037089
- **IFSC**: UCBA0001441

Contact person

Interested mineral industry professionals may contact Mr. M. Narsaiah, Secretary General of MEAI, at **meai1957@gmail**.com or via office phone at 040-66339625 / 040-23200510 or mobile at 9177045204 for additional details regarding this program.

Dr PV Rao
Co-Chair NACRI

(Continued from Page 32)

Titanium and beryllium – for aerospace and defense

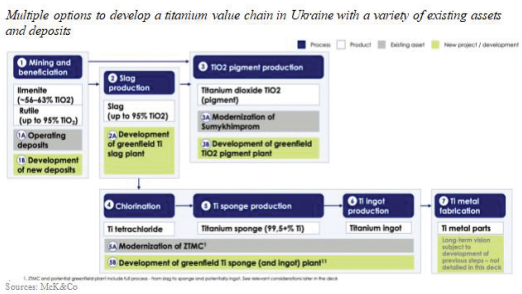
Titanium is a critical raw material for industries such as aerospace, defense, chemical, and pigment fabrication. Ukraine holds the largest titanium reserves in Europe, ranking in the top-5 for titanium rutile reserves, capable of meeting US and EU metallic titanium demand for over 25 years.

The global titanium supply chain is heavily reliant on China and Russia, both controlling a significant portion of production and processing (especially in the metal value chain).

Should Russia impose an export ban on metallic titanium, it would significantly impact Boeing, Airbus, and the aerospace and defense sectors, which rely on this metal for high-strength, corrosion-resistant applications.

Ukraine has extensive experience in titanium mining and processing in slag and sponge, but it has no melting capacity. Ukraine holds several deposits with no operators, one of them is the largest hard-rock ilmenite globally – Stremyhorodske, similar to giants such as Norwegian Tellnes and Canadian Lac Tio.

Therefore, Ukraine proposes foreign investors to partner with and invest in its domestic titanium industry, encouraging the construction of new melting fabrication, as well as the production of non-metallic products (white pigment) based on existing industrial sites in the Zhytomyr and Dnipropetrovsk regions.



Only a few countries in the world are engaged in mining and processing of beryllium ores. There is one explored Perzhansk beryllium deposit in Ukraine, a license for the development of which was granted in

2019 to a private Ukrainian investor. Beryllium oxide reserves of this deposit amount to 13.9 Kt, capable of satisfying over 20 years of global production.

Lithium and graphite – for energy storage

Demand for batteries is expected to multiply in the next decade, but 90% of the battery supply chain, particularly lithium processing, is controlled by China.

Lithium reserves in Ukraine are insignificant on a global scale, while at the same time, they make up roughly a third of the proven deposits of European countries, which positions it as a potentially important supplier of carbonate or hydroxide to the European battery industry.

Currently, lithium is not mined in Ukraine. Three explored deposits are known, one of them is licensed, and one is a promising occurrence. Unfortunately, two of four lithium sites are currently in the temporarily occupied territory. The necessary investments at the first stage of mining and production of carbonate or hydroxide are from $150 to 350 million for one project.

Ukraine can supply battery factories with natural graphite concentrate, which can later be refined into active anode material for battery cells.

There are six known deposits, one of which is operated by Australian public company Volt Resources, whose products are supplied to many countries around the world, including the USA, and licenses were issued for three more deposits in 2019 and 2021 (Ukrainian BGV Group, Turkish Onur Group).

The total amount of necessary investments for the modernization and construction of fabrication facilities for the production of high-purity spherical graphite at the two deposits is estimated at $650 million.

Rare, rare earth metals – valuable components for semiconductors

Opportunity for the extraction of tantalum and niobium and REEs are largely related to the development of the Novopoltava phosphate deposit and the Azov deposit of rare earth metals (both are temporarily outside the control of Ukraine) and potentially several other occurrences, together with the establishment of technologies for their extraction from ilmenite ores, especially accumulated in wastes of the production of seven operating mining and beneficiation enterprises.

Ukraine has significant reserves of germanium, which is a co-product of several minerals and is found in gas and hard coal, brown coal, as well as in ash, which is formed as a result of burning coal for the generation of electricity. In addition, germanium is dispersed in lead-zinc production waste, metallurgical slags, and carbonaceous clays.

In Soviet time and at the beginning of the 2000s, coking coal served as a source of germanium in Ukraine, its extraction was carried out at the facilities of coke chemical plants, and processing took place at the hydrometallurgical facilities of the Zaporizhzhya Titanium Magnesium Plant, fabricating purified germanium tetrachloride and optical monocrystalline germanium lenses.

It is promising to restore gallium production at the Mykolaiv alumina plant as a processing of aluminum bauxite from Visokopil deposit in the Dnipropetrovsk region, as well as to establish the fabrication of crystalline silicon from high-quality quartz sands, in particular, of the Glukhiv quarry in the Sumy region.

During the times of the USSR, 80% of the production capacity of silicon was concentrated in Ukraine, which was manufactured in the city of Zaporizhzhia at the semiconductor factory and aluminum production plant.

Conclusion

Therefore, the available resources in Ukraine and global prospects for the development of critical minerals – particularly, titanium, graphite, rare earths, lithium, beryllium – allow Ukraine to become an element of joint supply chains with NATO states and OECD partner countries, contributing to the integration of Ukraine's economy into modern high-tech production cycles.

Meanwhile, to explore those critical minerals, Ukraine needs large capital and modern technologies. Today, only private foreign companies can provide the necessary funds and expertise. To attract investment in the mining industry, the Ukrainian Government works to create the necessary regulatory environment.

Certain achievements can be considered the acquisition of several assets by venture investors from Australia (Volt Resources), Turkey (Onur Group), and Azerbaijan (NEQSOL Holding), as well as the conclusion of a number of important intergovernmental agreements, including the signing of Ukraine's Facility program with the EU.

At the same time, the strategic partnership with the USA can be considered the most promising, it is a logical and necessary action to ensure the rapid development of new competencies of Ukraine in high-tech and innovative sectors of the economy.

Roman Opimakh, Mining.Com / February 13, 2025

CONFERENCES, SEMINARS, WORKSHOPS ETC.

INDIA

26-27 Apr 2025: **Centre of Excellence in Mining (Continuous Improvement & Asset Optimisation)**. Udaipur, Rajasthan. Organised jointly by the Mining Engineers' Association of India, Rajasthan Chapter- Udaipur & Hindustan Zinc Limited, Udaipur. Venue: Ramee Royal Resort, Near IIM, NH-8, Balicha, Udaipur.

ABROAD

7 - 9 Apr 2025: **Underground Operators Conference 2025**. Adelaide Convention Centre, Adelaide, Australia. Contact: 1800 657 985 or +61 3 9658 6100 (if overseas)

8-9 Apr 2025: **International Conference on Geological Engineering ICGE**. Rome, Italy. Website URL: https://waset.org/geological-engineering-conference-in-april-2025-in-rome. Program URL: https://waset.org/conferences-in-april-2025-in-rome/program. Contact URL: https://waset.org

4-7 May 2025: **CIM CONNECT**. Montreal, QC, Canada. Organised by The Canadian Institute of Mining, Metallurgy and Petroleum. Contact Chantal Murphy, Conference Planner (Technical Program) at cmurphy@cim.org or +1-514-939-2710 ext. 1309.

6-7 May 2025: **Mineral Resource Estimation Conference 2025**. Perth, Australia. Contact: 1800 657 985 or +61 3 9658 6100 (if overseas).

20-22 May 2025: **Global Resources Innovation Expo 2025**. Brisbane, Australia. Contact: 1800 657 985 or +61 3 9658 6100 (if overseas)

21-22 May 2025: **AUSTMINE 2025**. Brisbane Convention and Exhibition Centre. Contact: Jason Berman, Event Director, jberman@etf.com.au, +61 2 9556 7991

10-12 Jun 2025: **Coaltrans China 2025**. Beijing, China. For more details Contact conferences@fastmarkets.com.

11-12 Jun 2025: **UK Mining Conference in Cornwall**. Organised at Princess Pavilion, 41 Melvill Road, Falmouth, Cornwall, TR11 4AR, United Kingdom. Contact: +44 7885 131097 or info@ukminingconference.co.uk.

21-22 Jun 2025: **International Conference on Oil, Gas and Petroleum Geology ICOGPG 2025**. Vienna, Austria. Website URL: https://waset.org/oil-gas-and-petroleum-geology-conference-in-june-2025-in-vienna. Organised by World Academy of Science, Engineering and Technology.

22-23 Jul 2025: **International Conference on Mining and Economic Geology ICMEG**. Berlin, Germany. Website URL: https://waset.org/mining-and-economic-geology-conference-in-july-2025-in-berlin

29 - 30 Jul 2025: **Life of Mine | Mine Waste and Tailings Conference 2025 (#LOMMWT2025)**. Brisbane Convention & Exhibition Centre. Contact by phone at T: 1800 657 985 or +61 3 9658 6100 (if overseas). Po Box 660 Carlton, VIC 3053, Ground Floor, 204 Lygon St, Carlton VIC 3053.

7-9 Aug 2025: **2025 China International Coal & Mining Exhibition**. China International Exhibition Center (CIEC) No. 6 North Third Ring Road East, Chaoyang District, Beijing , 100028, China.

10 - 13 Aug 2025: **Application of Computers & Operations Research in the Mining Industry**. #APCOM2025. PCOM Conference 2025, Perth Convention and Exhibition Centre, Perth, Western Australia. AusIMM T: 1800 657 985 or +61 3 9658 6100 (if overseas). Po Box 660 Carlton, VIC 3053, Ground Floor, 204 Lygon St, Carlton VIC 3053.

19-21 Aug 2025: **International Conference on Mining, Material, and Metallurgical Engineering**. Paris, France. Website URL: https://mmmeconference.com/. Organised by International ASET Inc.

2 - 4 Sep 2025: **Critical Minerals Conference 2025 (#CMC2025)**. Perth Convention & Exhibition Centre. Contact by phone at T: 1800 657 985 or +61 3 9658 6100 (if overseas). Po Box 660 Carlton, VIC 3053, Ground Floor, 204 Lygon St, Carlton VIC 3053.

25-26 Oct 2025: **International Conference on Hydrometallurgy and Mining ICHM**. Istanbul, Turkey. Website URL: https://waset.org/hydrometallurgy-and-mining-conference-in-october-2025-in-istanbul.

28-31 Oct 2025: **China Coal & Mining Expo 2025**. Organised by China International Exhibition Center (Shunyi Hall), 88 Yuxiang Road, Tianzhu Airport Industrial Zone, Shun Yi District, Beijing, China. Contact 852 28815889 or katherinelee@together-expo.com.

11-13 Nov 2025: **Environmental Integration on Sustainable Perspective and Beyond**. Manila, Philippines. Website URL: https://www.ierek.com/events/environmental-integration-on-sustainable-perspective-and-beyond-eispb#introduction.

25-26 Jan 2026: International Conference on Geological and Earth Sciences ICGES (ICGES 2026). Paris, France. Website URL: https://waset.org/geological-and-earth-sciences-conference-in-january-2026-in-paris. Organization: World Academy of Science, Engineering and Technology.

REQUEST TO READERS/ MEMBERS OF MEAI

The Editorial Board of the Mining Engineers' Journal (MEJ) requests our esteemed Readers/ Members of MEAI to share their valuable Research work in geosciences/ mining or Best practices developed/ adopted while employed in the mineral industry, for publication in our Mining Engineers' Journal (MEJ), for the benefit of the mineral industry fraternity.

Interested professionals may please contact the Editor, MEJ for obtaining "Author(s) guidelines" for submitting technical papers at **editor.mej.meai@gmail.com**.

Editor, MEJ

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